# Monitoring and evaluation of participatory forestry projects

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## Foreword

The purpose of projects is to help bring about future change. But the future is unavoidably subject to uncertainty. Even with the most careful prior study and planning it will be impossible to foresee all the events which will affect a project once it is underway. It is therefore important that project design incorporate procedures which will help project managers to cope with unexpected events. This is the role of monitoring and evaluation systems.

Monitoring and evaluation is particularly important in participatory forestry projects, the main purpose of which is to support rural people in creating, managing and using their own forest and tree resources. As experience with projects of this nature is limited they unavoidably contain much that is experimental, so that the need to learn and adapt as the project progresses is greater than in conventional forestry projects. Also, people's use of trees and forest outputs is usually embedded in complex human and resource systems, so that project implementation is affected by many non-forestry factors, which are often only partially understood at the project design stage.

The present publication describes experience gained in developing and operating monitoring and evaluation systems in two participatory forestry projects, one in Malawi and the other in Nepal. Both projects were supported by the World Bank, and were designed with joint FAO/World Bank assistance. The strong monitoring and evaluation component in each reflects the recognition at their initiation that these were innovatory projects, dealing with issues and situations about which much was then unavoidably unknown. At the same time, the application of monitoring and evaluation to such forestry activities was also new. With little experience elsewhere to draw upon, these exercises have themselves been of a pioneer and exploratory nature. They have already provided valuable information for the projects and future evolution of participatory forestry in these two countries. In addition, they have provided lessons which the World Bank and FAO have found useful in planning and implementing other projects. It is hoped that by making this experience available more widely, forestry planners and managers elsewhere will be helped in making fuller and more effective use of monitoring and evaluation.

The accounts of the two experiences have been prepared for FAO by the persons responsible for their development and operation during the periods described. Tara N. Bhattarai was Chief, Monitoring and Evaluation Unit, Community Forestry and Afforestation Division in the Department of Forests, Nepal, and J. Gabriel Campbell was the FAO Socio-economist in the HMG/UNDP/FAO Nepal Community Forestry Development Project, which provided support to CFAD. David French was the Senior Energy Officer heading the Energy Studies Unit in Malawi. The introductory paper, which reviews the basic concepts and issues of monitoring and evaluation, and its application in rural development activities, was prepared by Eric Clayton, Reader in Agricultural Economics at Wye College, University of London.

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by

Eric C. Clayton


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# MONITORING AND EVALUATION OF PARTICIPATORY FORESTRY PROJECTS

## 1. FEATURES OF PARTICIPATORY FORESTRY PROJECTS AND MONITORING AND EVALUATION

Traditional forestry projects, which are concerned with planting, growing, maintaining, felling or conserving trees, have two broad objectives - industrial or commercial and environmental or protective. The products of industrial forestry include saw logs and veneer logs, fuelwood, poles, gums and resins, and a range of by-products. Environmental forestry provides catchment protection (by controlling run-off and water supplies), soil erosion control (through shelter belts, common land reclamation, etc.) and conservation of ecology and wildlife (national parks, protecting species, etc.). Traditional forestry projects have been and still are the major activity of forestry departments of national governments and of international agencies, which are also directly responsible for decisions relating to the design, implementation and management of projects.

In recent years, however, "community" or "social" or "rural development" forestry projects, which have a different set of objectives and activities and a different management style from the traditional forestry project, have grown greatly in importance. Although some of the products of such projects may overlap those of traditional forestry projects, and to some extent have a commercial or market outlet, most of them are for indigenous consumption by rural people. They include fuelwood and charcoal (for cooking, heating, etc.), poles and timber (for building, etc.), animal fodder and food products (leaves and grazing, nuts/fruits, fungi, herbs, etc.). They may also have environmental and protective objectives similar to the traditional forestry projects, but they have additional objectives which makes them quite dissimilar. These include increasing rural employment and raising the living standards of the rural poor - not only by increasing the output and income of a project, but by trying to channel project income and welfare benefits to the poorest groups of rural people.

But the essentially unique objective of these projects is that which promotes self-reliance of the rural people through their active participation in the project activities. A participatory forestry project therefore aims to satisfy economic and welfare basic needs, based on a high level of involvement and participation of the rural people - consistent with the physical, and socio-economic environment within which the project operates. A forestry project which covers rural people's participation has been defined:

> "as a set of interconnected actions and works executed primarily by local community residents to improve their own welfare. There may be outside inputs - extension, training, guidance, technical help, financing, etc. - but its basic focus is on community involvement in doing something for itself."[1/]

Without this involvement or participation, a participatory forestry project will not produce its expected benefits.

The achievement of different project objectives can require a different type and style of project management. On traditional forestry projects, decisions will normally be taken by management and carried out by project employees. Whereas on participatory projects, many of the decisions and their execution will involve both management and project participants, whose views should be sought on important issues. Different project objectives and management problems will, therefore, call for different monitoring and evaluation systems;

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1/ FAO (1978) Forestry for Local Community Development. FAO For.Paper No. 7. Rome

or, at any rate, they will have a different emphasis. For example, as between traditional and participatory forestry projects, the emphasis of monitoring and evaluation will be less on production and more on people. An important objective of monitoring and evaluation in this case is to establish whether the project is meeting the needs of the rural people.

The extensive involvement of the rural community in many participatory forestry projects calls for new management skills and methods which forest services are in the process of learning. The implementation of this type of project has also given rise to a need for new kinds of information and new issues to be evaluated, especially concerning project objectives and the problems and effects of implementation on the participating peoples and their environment. Monitoring and evaluation systems will therefore tend to be more wide ranging and perhaps more difficult to operate than on traditional forestry projects. They will also be of particular importance for effective project implementation. Monitoring and evaluation is the newest component of the project planning cycle and its relation to other planning activities is shown in Figure 1.

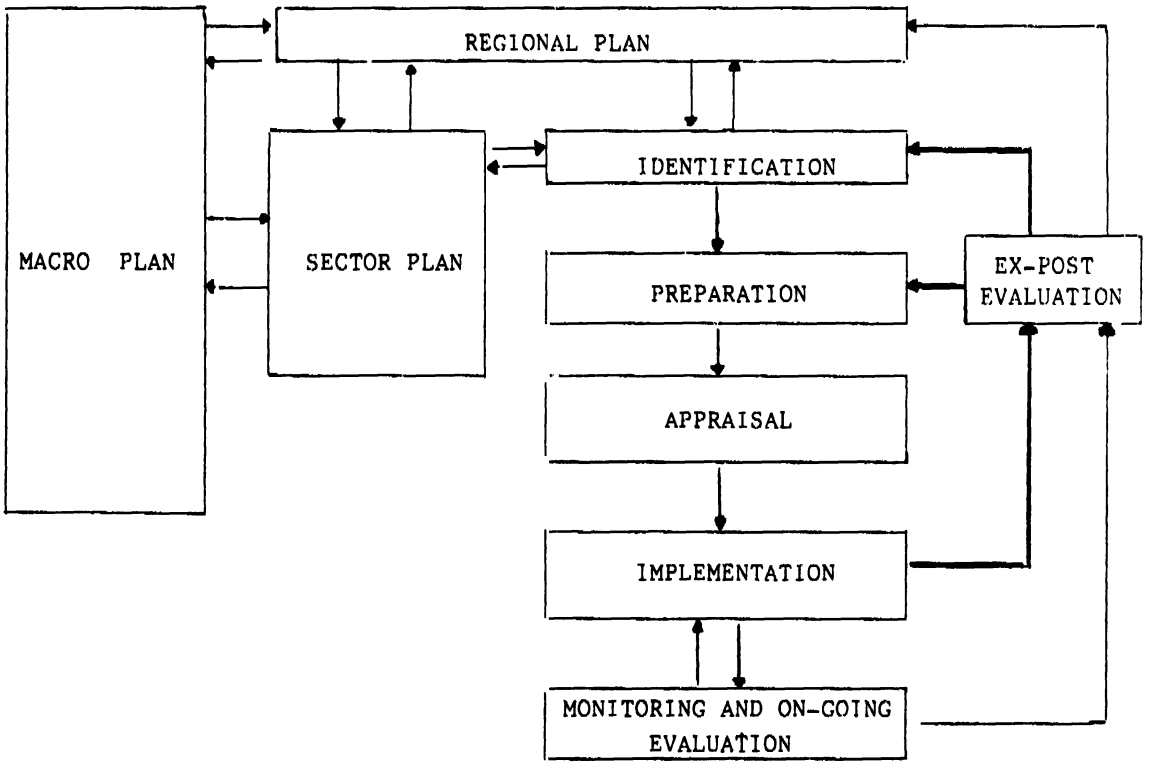


Fig. 1 Schematic Representation of Project Planning and Operation Activities

Source: E. Clayton and F. Pétry (1983): Monitoring Systems for Agricultural and Rural Development Projects. FAO, Rome.

The purpose of this paper, therefore, is firstly to discuss the principles and procedures of monitoring and evaluation as they relate to forestry participatory projects and, secondly, to introduce two case studies set in Nepal and Malawi which document the monitoring and evaluation systems in two different types of participatory forestry projects. The main objective of the project in Malawi was to eliminate an expected deficit of fuelwood through planting some 13 000 hectares of trees to cater for the needs of the commercial and industrial sector and some of the affluent urban dwellers as well as about 15 000 hectares to satisfy farmer's own needs of fuelwood and poles. While most of the industrial and commercial plantations were to be established and controlled by the government, those aimed at the satisfaction of farmer's needs were to be established directly by the rural people with government support.

The Community Forestry Project in Nepal was geared towards providing for the basic needs of hill communities for fuelwood, fodder, and other wood and secondary forest products through Panchayat and individual farmer plantations, better management of forest for increased production and protection of the environment and soil, and the developed and distribution of improved woodfuel burning stoves. These are among the first case studies on the subject and their value is greatly enhanced by reason of their clear presentation and detailed documentation of the design and implementation of their monitoring and evaluation systems. The case studies are also used to illustrate and provide examples in this introductory paper. Insofar as the active participants and intended beneficiaries of forestry participatory projects comprise farm and rural households, they resemble normal agricultural and rural development projects and consequently the basic principles and problems of monitoring and evaluation apply equally, with some important exceptions, to forestry participatory projects and agricultural development projects.

## 2. DEFINITION AND PURPOSES OF PROJECT MONITORING AND EVALUATION

In a general sense, project monitoring and evaluation are together the means by which project managers and planners can chart the progress of project implementation towards the achievement of its objectives, and which enables them to take corrective action when implementation deficiencies are detected by the monitoring and evaluation system. Secondly, the system also enables management to assess the relevance, efficiency and effectiveness of a project, together with its impact on project participants and the environment. Thirdly, the two related but distinct activities of monitoring and evaluation can provide guidance and lesson for the planning of future projects.

Useful definitions of the two related activities are:

> "Monitoring is a continuous or periodic surveillance over the implementation of a project to ensure that input deliveries work schedules, targeted outputs and other required actions are proceeding according to plan"[1/].

Its purpose is to supply management with the means of achieving efficient and effective project operation and performance, by providing it with appropriate information and feedback relating to the critical activities of a project. It thereby provides management with the basis for taking timely corrective action by identifying constraints and inadequacies of performance of the project. Monitoring should be considered part of a management

1/ IFAD (1984) Guiding principles for the design and use of monitoring and evaluation in rural development projects/programmes. A panel on monitoring and evaluation for rural development. ACC Task Force on Rural Development. Rome. A list of definitions can be found in Annex 1.

information system, an integral component of management decision-making and hence an essential ingredient of good management practice. In most cases, therefore, monitoring should be undertaken at all levels of the management hierarchy.

> "Evaluation is a systematic process which attempts to assess as objectively as possible the relevance, effectiveness and impact of a project in the context of the project objectives".[1/]. To elaborate further, evaluation essentially analyses the rationale and logic of the project (objectives/design), reviews the implementation process (inputs, activities, outputs and implementation management) and the emerging results (outputs, effects, impact), and assesses in the light of the foregoing, the validity and relevance of project objectives/design and the project effectiveness and efficiency in achieving the intended results.

It is a learning and action-oriented management tool which seeks to improve the effectiveness, relevance and impact of currently operating projects and of future projects. On current projects, on-going evaluation makes a continuous analysis and assessment of the outputs, effects, impact and (to some extent) the relevance of a project. It provides information (in concert with monitoring) for management to make any needed adjustments to the objectives[2/], activities, operation and performance of an on-going project. It includes examination of whether project assumptions are valid - because the planners may have got them wrong, or unforeseen factors have made them invalid, or experience with the project requires their redefinition.

> Participatory evaluation will usually form part of on-going evaluation. It involves the feedback of information and opinions from participants and others to project staff, during informal and formal discussions. It is an important means of detecting unforeseen outcomes which have adverse effects and impact on the rural people, and of checking the validity of project activities and objectives.

> Terminal evaluation[3/] at the completion of a project, and ex-post evaluation some years after the completion of a project, assess the achievement of long term project objectives and their impact on and relevance to its intended beneficiaries and the project environment. Its purpose is to assess the overall achievements of a project, in terms of its activities, outputs, effects and impact, and to provide lessons to assist the planning of future projects.

It will be seen that monitoring and evaluation are critically linked together providing and analysing relevant information for decision-making; together they provide an information system for management decision-making[4/]. The essential issue is that

1/ IFAD (1984) op. cit.

2/ There will be legal and political factors which limit the ability of management to make needed adjustments to project objectives. This is discussed later.

3/ The mid-term review mission evaluates a project during implementation and can be a useful means of inducing needed changes during the life of a project.

4/ Management is used here with the wider meaning of all concerned with decision-making - from farmers to ministers.

the major purpose of monitoring and evaluation is to provide reliable and timely information to assist the solution of specific problems which are of importance and concern to the management and participants of a project. A monitoring and evaluation system is thus oriented towards problem-solving; but to achieve this, for the many different types of projects, it must be flexible in its use of the various means of information collection and analysis. It must be dynamic, in the sense of responding to the needs of management which faces a changing situation that bring about new problems to resolve. The original design of monitoring and evaluation system must therefore continuously change to provide the information for it to perform its problem-solving role.

A complete monitoring and evaluation system should extend from the project, through the administrative hierarchy, up to ministry and sectoral level. At higher levels it will be more "strategic", concerned with overall progress, major problems, budget disbursements and the planning of future projects. As the monitoring and evaluation information passess up the hierarchy, it will be increasingly summarised for strategic surveillance purposes (in quarterly and annual reports).

As experience is gained with monitoring and evaluation, the value of information systems becomes increasingly clear. The surveillance and assessment of project activities, input deliveries, work schedules and project outputs are seen to be a valuable means of improving project efficiency. It is important too as a means of improving project effectiveness, by the surveillance and assessment of project objectives, assumptions, effects and impact. The probing of objectives and impact by monitoring and evaluation studies can reveal deficient planning, due to invalid assumptions, which may take a project in the wrong direction - as the following Malawi case study shows. The spread of monitoring and evaluation systems has increasingly exposed the flimsy basis upon which much project planning rests But, on the positive side, the exposure of these defects is likely to prove an important feedback for improving the planning of projects in the future.

The operation of a monitoring and evaluation system can produce additional benefits to a project - as a spin-off. The Nepal case study records their presence and they include: improved work planning (completing a form makes staff think through a task); improved extension (it ensures that staff discuss issues with participants); incentive to improved staff performance (induces a competitive element between them) and improved project 'image' (it provides politicians with facts rather than guesses about a project).

## 3. ELEMENTS OF PROJECT MONITORING AND EVALUATION

A project monitoring and evaluation system will focus on five project elements - the operation, performance, effect, impact and context of a project. These elements are the constituent parts of a comprehensive system, all equally important; a continuum of activities. However, as the following case studies illustrate, different project will require monitoring and evaluation systems which place a different emphasis on these elements. The emphasis will be decided during the designing of a system and be based on the project logic wich connects the assumptions, activities, outputs, effects and objectives of a project. They are summarised in the project objective structure[1/]. Although elements overlap, they mainly comprise the following:

Project operation embraces the many tasks and activities performed regularly or intermittently, which are essential for the prescribed functioning and implementation of a project. They include the delivery and distribution of project inputs such as fertilisers and seedlings; activities such as credit and extension programmes; the operation and maintenance of machinery and equipment; financial flows and staffing.

1/ An example of a project objective structure is given in Annex 2, which related to a recent extension and credit project in Turkey.

Project performance is measured by the outputs which result from project operation. It may include aspects such as nurseries constructed seedlings produced and distributed, area planted to trees, forest area managed, fuel stoves distributed.

Project effects are the outcome of project operation and performance and include immediate project objectives and goals. Effects include more trees grown, increased supply of fuelwood, improved adoption of new methods, labour time saved collecting forest products, providing the forest product needs of rural families.

Project impact is the result or consequence of project operation, performance and effects[1/]. Impact relates the results of a project to its long range objectives and goals and indicates the extent to which they have been achieved. It denotes changes in the status of beneficiaries resulting from a project; for example, in family incomes, nutrition, and living standards. It includes the achievement of wider welfare objectives such as increased literacy and wider participation of project beneficiaries in project decision-making. Project impact is further concerned with unplanned changes in the local environment and economy that result from implementation of the project. For example, soil erosion, environmental damage to wildlife and natural flora, forest resources, catchment areas and adverse price effects on forest inputs and products.

The monitoring and evaluation of project impact will require a longer time horizon than the other elements. Some impact changes may be detected during the implementation of the project - increased farm incomes may be generated quickly on a very successful project. But in other cases, the full impact of a project will not emerge, in a substantial way, until some years after its full development or completion. Increased literacy or increased capacity for self-sustained development are obvious examples. The impact of traditional and participatory forestry projects will also tend to have a long time horizon because of the relatively lengthy period required for many trees to reach maturity. Quick maturing trees will of course shorten this period.

Project context[2/] relates to the physical and socio-economic "situation" to which the project is intended to respond, the attitudes of rural groups (on and off a project) to the activities and objectives of a project, and the activities of project and non-project people which are relevant to the project objectives. This element of monitoring and evaluation attempts to test the validity or relevance of project objectives and their related activities. Its purpose is to make clear the overall context within which a project is operating and to which it is intended to respond, in order to judge whether the original assumptions and major objectives of a project are in line with the situation and consistent with the "needs of the people". It recognises the problem of planning projects with insufficient information and unclear objectives, and seeks to improve their accuracy and relevance and hence the outcome of a project. For example, in the Malawi case activities were centered on this element of monitoring and evaluation. Field surveys were undertaken to test some of the project's basic assumptions relating to the scarcity of fuelwood, the availability of seedlings for smallholder tree planting, the ability of rural families to undertake this activity independently, whether improved stove designs would in practice reduce use of woodfuel and so on.

1/ For example, increased yield effects (through better soil conservation), lead to an improved income, nutrition and welfare impact - in the longer term.

2/ This phrase was suggested by David French during discussions on early drafts of the papers included in this publication.

The difference in style of management on traditional forestry projects and forestry participatory projects will call for monitoring and evaluation systems with a different focus and emphasis. The focus in the case of traditional forestry projects will be on monitoring project inputs, outputs and financial flows, with limited attention being given to the evaluation of project context and impact. By contrast, on forestry participatory projects there will be more emphasis on the evaluation of project effects and context, in addition to monitoring project inputs and activities. Forestry participatory projects will increase the involvement of the rural people through monitoring and evaluation activities by discussing and questioning participants and others on their views of the assumptions, objectives and effects of the project. It will include "participatory evaluation", achieved by informal encounters and formal meetings of the rural people (or their leaders) and the project staff.

## 4. MONITORING AND EVALUATION INDICATORS

Monitoring and evaluation of project operation, performance, effects and impact is mainly based on the observation and verification of variables or indicators of project inputs, outputs, activities and effects; also of project objectives, external factors and constraints. A first step in this process is therefore to identify, specify and select the appropriate indicators. Many of the selected indicators will be derived from an inspection of the objective structure of a project (or project logic), which spells out the planned inputs, activities, outputs, effects and objectives of a project. It is not too difficult to identify and select most indicators, especially where they are objectively verifiable measures of facts and events such as delivery and distribution of inputs, seedlings production and disposal, number and area of (village) woodlots established, species composition of woodlot plantings, seedling survival rates, tree growth rates, yield and output of fuelwood, number of extension visits and demonstrations, sales and prices of forest products, etc. (see Annex 1 of Nepal case study). It is fairly straightforward to identify and measure such indicators.

The selection of indicators (monitoring and evaluation of "context") to test the validity and relevance of a project assumptions and objectives is less straightforward. Indicators are likely to relate to production and consumption of forest products by wood growers and wood users; their perception of an attitude to wood scarcity; the degree of commercialisation of wood products; the prices of forest products in various markets, from the source of wood to the final users; preferred patterns of social organisation for tree planting and similar activities; responses, both on an off the project, to wood scarcity in terms of tree plantin the use of wood substitutes, the adoption of more efficient wood using technologies, etc. (see annexes of Malawi case study).

The monitoring and evaluation of 'critical external factors' must not be neglected. These are exogenous to a project, and can have unexpected effects on it. Market prices of purchased inputs and project outputs and wheather conditions are examples of these. Other external factors which can adversely affect project operation and performance, and which are outside the control of management include domestic inflation, shortages and late delivery of materials, failure to provide infrastructure to a project on time (such as electricity or a road), distortion of forestry price policies and other market defects. It is necessary to select and monitor indicators relating to these factors, not always to assist project management to adjust or adapt to them - often this is not possible - but to pinpoint possible causes of deficient project performance arising from these - which might otherwise be laid at the feet of project management.

Sometimes it is not possible to directly observe and measure project monitoring indicators. There are many reasons for this, sometimes the high cost or practical difficulties of collecting information (field surveys for example can be costly), or it can be difficult to distinguish the effects of a project input or activity (for example, increased fuelwood production may be the result of improved extension services or fertiliser supplies) or a long time horizon of production may make direct measurement impracticable. In these cases, it may be necessary to use indirect or proxy monitoring indicators. Because income surveys of rural households are often costly to undertake and rather slow to produce results, proxy indicators of income status are sometimes used. The standard of family housing and the amount of household equipment possessed by rural families have been used as proxy indicators for income. Information on these items can be obtained relatively quickly and cheaply by a single visit, visual observation survey. But this saving can be at the expense of lost precision. For example, these indicators deal with the disposal of income for one purpose only - the purchase of household durables - which ignores the disposal of income in other directions including consumptions, investment on the family holding and savings.

The yield and production of most forest products is linked to the often lengthy period of growing trees, it is therefore not possible in the short and medium term to use the direct effects and impact indicators of forestry projects; instead, proxy indicators for these are used, such as seedling survival rates and tree growth rates. Since many untoward events can occur between planting and felling of trees, proxy indicators will sometimes diverge from the true effect and impact indicators. A degree of caution is therefore necessary when interpreting proxy indicators, especially where the linkage between them and the direct indicators is uncertain. The following Nepal case study provides a good example of both indicators which can be directly measured and those that can only be measured indirectly by proxy variables.

The process of identifying and selecting monitoring indicators has an important influence on the usefulness of monitoring and evaluation system and on the efficiency and effectiveness of project implementation, because it will determine the total amount of information in the system. The full range of indicators derived from the project objective structure and consideration of unexpected effects will often far exceed the capacity of the monitoring and evaluation resources to handle them. Priorities of indicator selection will, therefore, be influenced by constraints - for example, when information is too difficult to collect or to measure or when the motivation and ability of staff affects the accuracy of information collected. And on the other side, the demands of the major users of system must receive consideration.

The aim will be to balance these issues so that the total amount of data or information can be adequately handled by the monitoring and evaluation resources. In practice, this will be a process of trial and error which will call for modifications to the system, influenced by experience gained in operating the system and by feedback from the users of the system. As Bhatarai and Campbell rightly observe:

> "data requirements thus become a function not only of what should logically be collected and measured, but also of relevance, measurability, feasibility, timeliness and simplicity".

## 5. DESIGN AND IMPLEMENTATION OF MONITORING AND EVALUATION SYSTEMS IN PARTICIPATORY FORESTRY PROJECTS

As with non-forestry projects, participatory forestry projects will vary in size, organisation and purpose. But, in general, they will aim to achieve some or all of the following objectives:

- to improve the living standards of rural peoples, especially the poorest groups, in terms of cash income or home consumption, by encouraging them to increase the production of fuelwood, fodder, timber, poles and secondary forest products;

- to decrease the consumption of fuelwood by testing and distributing improved energy systems such as charcoal braziers, improved wood stoves, charcoal kilns, etc.,

- to promote the self-reliance of rural peoples by their active participation in the management of forest resources - individual and village woodlots and communal forests;

- to avoid or reduce environmental degradation including conservation of soil and water resources.

The pursuit of these objectives will usually involve the following kind of project activities:

- Construction and operation of nurseries for seedling production and distribution; establishment of different types of plantations, e.g., plantations established by forestry departments for communal use, community and village woodlots, household woodlots and windbreaks.

- Distribution of seed or seedlings to rural peoples for their own planting and development and distribution of improved woodburning stoves.

- Increased forestry extension services to improve the establishment and maintenance of trees, to encourage the use of improved stoves, to promote better farming methods (including increased forage production within plantations and improved livestock husbandry) and to encourage a more active participation of the rural people in the project activities and their management.

This wide range of objectives and activities implies the need of a comprehensive monitoring and evaluation system whose emphasis will vary according to type of project. The focus will be on the surveillance and assessment of project inputs, outputs, effects, context and to a lesser extent on impact. Close attention will be given to the number of nurseries constructed, seedlings distributed, number of hectares planted, improved stoves distributed, and so on - these are the indicators which reflect project inputs and outputs. The survival of seedlings by species, the number of trees planted and surviving, increased output of forest products, increased grass and forage production, and the increased use of improved stoves are the indicators which will reflect project effects. Monitoring and evaluation of project effects and context will focus on prevailing forestry and farming practices and attitudes of the people to project objectives and activities.

On participatory projects some impact monitoring and evaluation will be undertaken which will include surveillance and assessment of timber and forest products produced against people's needs, increased income and living standards of project participants, decrease in fuelwood consumption due to improved woodburning technologies, increased participation of the rural people in management of the project, and improvement in the physical environment and its resources. Because the studies which measure and assess these effect and impact indicators require quite significant monitoring resources for baseline and ad hoc field surveys, they will be undertaken only once or infrequently during project implementation.

The different elements of a monitoring and evaluation system often require different methods of data acquisition and processing. The monitoring and evalaution of project operation (inputs, activities) and performance (outputs) is closely connected with technical and managerial duties of project staff. Monitoring their activities relates to the extension and recording of scheduled task such as constructing nurseries, producing and disbributing seedlings, establishing woodlots, operating extension and credit activities and so on. The records are then processed and transmitted to a prescribed point in the management structure. The efficiency of this aspect of the system depends on the specification of procedures and indicators and on the motivation of project staff.

The monitoring and evaluation of project impact, much of project context and effects, are based on data and indicators which are usually gathered by field survey. In planning designing and implementing monitoring and evaluation systems, it is important to be aware of this crucial distinction in information gathering methods. In general, information deriving from field surveys is more difficult to acquire, measure, process, analyse and can be subject to greater error. These difficulties arise because they are associated with the usual problems of empirical field studies such as inadequate sampling and survey design, untested field questionnaires, response bias, visit frequency and faulty analytical procedures used for interpreting the results. Context monitoring and evaluation which probes among other things, the relevance of project objectives, such as in the case of the project in Malawi, will sometimes rely on field surveys, especially to discern the attitude of rural peoples to the project objectives. This is especially difficult requiring great care in the formulation of questionnaires to avoid "biased" questions and needing large samples to keep sampling errors within bounds.

Monitoring and evaluation based on field surveys can also have a different time dimension for data acquisition, processing and analysis - this is especially true for impact monitoring and evaluation which uses baseline and household surveys. Where projects have a farming ingredient, impact monitoring will involve baseline and subsequent field surveys to establish, among other things, net household incomes (which are far from easy to define). And for this, data acquisition (field visits) can take up to a calendar year and then many months after that for data processing and analysis of results. In short, those elements of monitoring and evaluation systems which rely on data acquisition by field surveys can be difficult, lengthy and costly. Sometimes a once for all survey is sufficient, but where impact indicators relate to levels of income, living, nutrition, etc. then surveys are likely to continue intermittently over the period of project implementation.

Having said that, the monitoring and evaluation project effects, impact and context can be based on surveys which are once for all, relatively easy to design and execute (though sampling and non-sampling problems will not be avoided) and which can be completed in a relatively short period of time. Single focus surveys can be like this; for example surveys of seedling and plantation survival rates, the extent of private tree planting, species preference, improved stove use, and surveys of extension effects. A good deal of context monitoring and evaluation involves one-off surveys of relatively short duration. Such things as rural and urban energy surveys investigating wood and charcoal consumption patterns, marketing studies of wood, charcoal and other forestry products and surveys of wood availabilities (see the Malawi case study). Participatory monitoring and evaluation is somewhat different in that it is continuous and based on an informal survey approach (often private or small group dialogues with participants and others). It can provide quite rapid feedback on implementation problems and successes as well as on adverse effects and impact.

Monitoring and evaluation of the physical and socio-economic environment (unplanned effects) is an important and somewhat neglected area. One reason for this neglect is due to

uncertainty about what is to be monitored until the project has been operating for some time. It is important because the impact of a project, both on and off it, can be negative as well as positive and because it can be difficult to predict.

> "The impact of rural development and agriculture projects on the environment is important, not only to maintain the quality of life but also to sustain the natural resources base on which future agricultural production and growth depend. Past utilisation of natural resources like land, water, forest and fisheries have often promoted the use of these ecologically interlinked systems in excess of their biological carrying capacities, leading not only to environmental stress, but also to a reduced food and fuel producing capability and thus the impoverishment of the rural poor who depend directly on the environment for their basic needs"[1/] .

The aim of monitoring the unplanned effects of a project is to identify and predict their likely effects on the bio-geographical environment and on the health and well-being of the rural people on and off a project. Projects which involve clearing of land can have several environmental effects, such as:

- where land is marginal, its use for cultivation can lead to soil compaction, erosion, mineral leaching, and hence the degradation of land which may have future agricultural potential;

- it can contribute to increased erosion on sloping sites with increased sedimentation;

- it can affect future forest production on affected areas;

- it can lead to loss of shade and forage available in the dry season;

- it can cause destruction of plant and wildlife species.

Socio-economic unplanned effects of a project cover items like the demand for project inputs and the supply of forest products and their impact on the respective markets. Occasional market studies are, therefore, required to monitor changing conditions which might follow project implementation and the continuous monitoring of input and output prices are also necessary.

The implication of all this is that the design of a monitoring and evaluation system will not only be influenced by the type of project, and the needs of the users but also by the resources available to implement the system. The focus or the balance of the system on the different elements, with their different data acquisition and processing methods and differing time horizons, will require a careful choice to be made regarding the disposition of resources between the different elements, where the resources are limited - which will commonly be the case.

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1/ IFAD (1984), op.cit.

## 6. INFORMATION DELIVERY SYSTEMS

### Methods of information collection [1/].

The well-designed, properly functioning project monitoring system should provide the right information, in the right form, at the right time, to the right place (in the management structure) and with the right frequency. But whether this is achieved depends greatly on the nuts and bolts of the system. These relate to the observation, measurement, recording, processing, presentation and reporting of data. Observation and measurement can take the form of noting and recording tangible events, such as seedlings production and disposal, woodlots established, species composition, seedling survival rates, area, density and girth of trees planted, etc. Another source of information comes from formal and informal surveys; also interviews and dialogues with project participants and others. These data are recorded in field notebooks, on specially devised forms and on survey questionnaires. The use of surveys and questionnaires to collect project information is a skilled activity requiring careful planning by trained personnel.

### Processing and analysis of information

Then follows the data preparation, processing and/or analysis phase to cast them into the appropriate form for evaluation purposes. Data recorded on individual field notebooks, field sheets and questionnaries must be transferred to analysis proforma, progress charts and computer disc. The processing/analysis stage can vary from the simple assembly of a time series to statistical analyses and computation of complex project parameters to discern causality between project variables. Following this, there is the presentation and display of data what Casley calls "converting data into information". This means that the user of the monitored output must find it usable. Failure to give due attention to this critical phase can seriously impair the value of monitoring and evaluation systems in the following ways:

- data remain on the questionnaires, unanalysed and valueless;
- magnetic tapes containing large data files are prepared but they remain unusable due to lack of proper validation procedures or documentation;
- tabular printouts, large in volume, long in detail, lie in files gathering dust in the data library;
- reports contain adequately presented summary tables derived from a baseline survey, but are available to the user only at the end of the project; and
- reports are full of tests of significance, analyses of variance, correlation matrices, etc., but do not set out any conclusions or suggest a range of options for action [2/].

1/ This is dealt with in some detail by Casley, D.J. and Lury, D.J. (1981), op. cit Part 8 and 9. But also see Bhattarai, T.N. and Campbell, J.G. (1984). Data Collection Guidelines for Monitoring and Evaluation of Community Forestry Activities in Nepal. Field Document No.5, IMG/UNDP/FAO. Community Forestry Development Project. Nepal.

2/ D.J. Casley and D.A. Lury (1981), op. cit.

At this stage, those responsible for operating the monitoring and evaluation system must have clear cut answers to the following questions: to whom is the information to be directed? At what time and with what frequency? And in what form? The recipients of information will include project officers and participants, project managers, coordinating agencies and ministries, sector planners, government ministers and donor agencies. These data will be transmitted to these recipients in a very different form, with different levels of aggregation and brevity and with different frequency. Casley and Lury suggest the following guidelines for converting data into information in a form appropriate to the particular user:

- the definition of variables and tabular headings should be clear to the user who will not always have either a numeric background or technical knowledge of the topics discussed;

- the depth of statistical analysis must be geared to the level of user (correlation coefficients and significance tests will confuse rather than enlighten the user untrained in statistics);

- the tabular layout, including the use of averages, dispersion indices, ratios, etc., should be simple and clear - a set of simple two-way tables may be better than a complicated four-way cross classification;

- text accompanying tables should summarise the main highlights revealed by the tables, indicating the conclusions that may be drawn;

- graphical and other diagrams will be particularly useful in focusing the user's interest and aiding his understanding[1]/.

Reporting results

Having converted data into information, it must then be reported to the appropriate user. The transmission of information can be done verbally, formally or informally, at project meetings; by regular up-dating of charts or graphs in project offices; in short memoranda for urgent and rapid distribution; in regular or formal reports of surveys. Reports can be quite brief summarising the observations and impressions of project officers following a field trip; they can be bi-annual or annual reports summarising the state of the project; or they can deal with particular aspects or special problems of the project, usually resulting from a field survey.

Reports should be standardised so that the information received can be easily compared to previous reports; short and summarised further as they move up the management hierarchy; easy and interesting to read. They should also identify problems, exceptions, and deviation as well as special achievements, to facilitate the process of management by exception; specify data reliability and explain deviations and exceptions where possible; suggest alternative actions and decisions to be taken; and be timely [2]/.

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1/ For examples of tabulation and layout of monitored information prepared for the social forestry programme in India see R.H. Slade and Noronha, H. et al. (1984) An Operational Guide to M & E of Social Forestry in India. World Bank (draft). Some examples are reproduced in Annex 3.

2/ F. Petry (1984) Designing a Monitoring and Evaluation System. Op. cit.

## 7. ISSUES AND PROBLEMS ARISING FROM MONITORING AND EVALUATION EXPERIENCE

As the concern of this volume is to underline the value of monitoring and evaluation and encourage its use on participatory forestry projects, it is relevant at this point to mention the difficulties that have sometimes been experienced in order to reduce the likelihood that thus emerge as problems in the future.

The implementation of a monitoring and evaluation system raises the important question of who should undertake it. Should the tasks be undertaken by the project management staff or by a separate monitoring and evaluation unit? Where project staff undertake monitoring and evaluation activities, their influence, at the design stage, will be to keep the system as simple and cheap as possible; to collect only the information which is relevant and useful and deliver it to the right place, in a form which will ensure its operational use. One problem with this approach is that project staff often complain of the heavy burden incurred by their monitoring and evaluation duties which can adversely affect their normal project duties. Another problem is that project staff are probably less disposed to question project assumptions or evaluate their own performance.

A separate unit is more likely to be professionally competent and efficient being made up of qualified staff. And it will take much of the burden off the shoulders of project staff. It will also have a degree of independence from project management to allow it to perform critically and independently. This especially applies to monitoring and evaluation which questions the relevance of project objectives and hence the validity of some of its activities. Without some degree of independence, a monitoring and evaluation unit may be prevented from pursuing this critical approach. However, if carried too far, it could soon alienate management to the detriment of all.

Indeed, the introduction of units having sole responsibility for the design and implementation of monitoring and evaluation systems has underlined the need to involve project management more closely at all stages. Since the purpose of monitoring and evaluation is to assist project management to function more efficiently and effectively, it is increasingly recognised that management collaboration in the design and implementation of monitoring and evaluation systems is very desirable.

Project management collaboration not only allows it to understand what monitoring and evaluation is for, it enables it to have an important say in what information should be collected and to keep within bounds the amount of time spent on these activities. Management participation is likely to be an antidote to the generation of excessive, unnecessary and unused information, and is a vital means of increasing the effective use of results.

### Quality of monitoring and evaluation information

Monitoring and evaluation systems produce information of varying accuracy and validity. The direct measurement of physical variables is likely to be most accurate - such things as nurseries established, seedlings distributed, weekly prices of forest products, etc. But if the variables relate to household plots and woodlots, for example, seedlings planted and surviving, tree growth, etc., then sampling (and perhaps measurement) errors come in. Indirect measurement of sample variables using socio-economic surveys will certainly involve sampling and measurement errors (arising from many sources including faulty recall of respondents). Problems of validity arise especially if opinions on context and impact are sought. The informal contacts increase the change of biased

sampling (and group leaders may not be representative): also, it is not easy to summarise from unstructured interviews a sample of judgements and opinions or be sure of its validity. Monitoring and evaluation units should try to give users some idea of the accuracy of its results, for if it gives the impression that they are of equal accuracy, some very wrong decisions could result.

Resistance to project monitoring and evaluation

It is fashionable now to approve project monitoring and evaluation without question. In practice, however, monitoring and evaluation systems are sometimes found to be poorly operated and of limited effectiveness, even where they have been well designed and run by competent staff. The problem here may be that of unstated opposition or covert resistance to monitoring and evaluation systems for several reasons. Sometimes there is a dislike of monitoring because, in exposing deficiencies of project implementation, it reveals on occasions weaknesses of management; sometimes these can be linked to individual members of project staff which obviously is not welcome. In some cases, project staff give a great deal of their time to monitoring activities which diverts their efforts from the day-to-day running of a project and which they sometimes resent. Again, much of the monitored output may not be used by project staff because they have not been consulted about the monitoring system and, therefore, may have little idea of what the information is for and understandably assume it will be of little value to them in the performance of their project duties.

The Nepal case study records field resistance by some project staff, arising out of their cultural background, the low pay and lack of career prospects. Whereas, staff resistance, as recorded in the Malawi case study, appears to have stemmed from their resentment of the monitoring and evaluation unit which was independent and critical.

If resistance at project level is to be overcome, a conscious effort must be made to deal with the reasons for this resistance. An important way of doing this is to have a close liaison between project staff and the monitoring and evaluation unit, so that the former will understand the purpose of the system, not only to provide for management needs and improve its efficiency, but also to improve the relevance and impact of the project.

## 8. THE PARTICIPATORY FORESTRY PROJECTS CASE STUDIES

The following case studies, in Nepal and Malawi, describe the main features of the projects, their monitoring and evaluation systems and details of their functioning and achievements. The projects have rather different objective and comprise somewhat different activities, and this is reflected in their monitoring and evaluation systems. However, both are very different from traditional forestry projects. The two projects aim primarily at increasing the welfare of rural families based on expanding forest resources and improving their management. The Nepal project in particular has the clear objective of increasing rural self-reliance.

The Monitoring and Evaluation Unit in the Nepal project came into being with the project and it was an integral part of it from the beginning. Thus, the perspective of monitoring and evaluation in this case tends to be from inside the project. Context monitoring and evaluation activities were also carried out, but in this case these activities generally verified the appropriateness and relevance of the initial project objectives and therefore no major adjustments or further major efforts in analyzing the project context were called for.

The Malawi Wood Energy Project presents a different case. The project was conceived without a monitoring and evaluation component. An Energy Studies Unit was created at about the same time as the project, but outside the project's administrative structure and with a set of duties related only marginally to the immediate work of the wood energy project. The Unit was created to study general patterns of energy use, the extent and consequences of fuelwood shortages and the future projects for fuelwood production. The Unit was thus problem centered rather than project centered. For these reasons emphasis in this case tended to be on assessing the relevance of the project in terms of the broad energy situation prevailing in the country, testing the basic assumptions on which the project was based and probing the validity of its objectives, i.e., analyzing the general context of the project.

Due to these differences, methods of gathering data, the coverage of the studies carried out, the evolution of the linkages with the administrative structure of the projects, and the nature of the monitoring and evaluation staff, etc., were different in the two units. Thus, the case studies illustrate different conditions in which monitoring and evaluation systems may effectively operate. They also illustrate the need to design systems which cover all elements of operation, performance, effects, impact and context. The relative emphasis of monitoring and evaluation activity on these must vary from project to project, depending upon the type and size of project and also upon how well the project has been planned and geared to meet the needs of the rural people.

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## ANNEX I

### Some Definitions for Monitoring and Evaluation[1]/

A project is a planned undertaking which is a set of interrelated and coordinated activities designed to achieve certain specific objectives within a given budget and within a specific period of time (e.g., IFAD and World Bank projects, training projects of ILO).

Projects are generally part of a sub-programme or programme. Several programmes, in turn, form part of a plan (e.g. a Five-Year Plan, Annual Development Plan).

Both projects and programmes are organized activities to achieve specific objectives, the difference being one of scope, magnitude and diversity.

The purpose of a programme or a project is to convert a set of resources into desired results (objectives) through a set of activities or processes. The set of resources are called inputs. The results are divided into three broad categories, e.g. outputs, effects and impacts of which the latter two correspond to a project's hierarchy of objectives, namely, immediate or short-term, and long-range objectives respectively.

The relationship of these four concepts may be illustrated in a diagram, as follows:

```
Inputs----------(activities)----------Outputs-------------Effects---------------Impacts
                                      ---------------Results (objectives)-------------
```

The four terms are defined as follows.

Inputs are the goods, funds, services, manpower, technology and other resources provided for an activity with the expectation of producing outputs and achieving the objectives of a programme/project.

Outputs are the specific products or services which an activity is expected to produce from its inputs in order to achieve its objectives. Examples of outputs of a rural development project are: (a) physical outcomes, e.g. area irrigated, number of cooperatives established, kilometres of roads or irrigation canals constructed, health facilities or schools constructed; and (b) services provided, e.g. farmers or extension agents trained, credits provided, health services provided.

It is important to note that an activity may have an intermediate output, i.e. its output may serve as another activity's input, e.g. irrigation water is an output of an irrigation project, but an input for agricultural production. Similarly, training of extension workers is an input for raising the quality of the extension service but the extension service itself is an input for higher agricultural production.

Effects are the outcome of the use of project outputs. Examples include agricultural yields - specifically the incremental yields obtained from irrigated land, increases in fertilizer use as a result of improved credit services and supplies, increased use of health services or higher attendance at schools because of availability of additional facilities or improved services, and so on.

1/ Guiding principles for the Design and Use of Monitoring and Evaluation in Rural Development Projects/Programmes

Project effects will usually begin to emerge during the implementation period; however, full effects usually do not emerge until after full development of a project.

Impact is the outcome of project effects. It is an expression of the results actually produced, usually at a higher level of broader, long-range objectives, as a result of a project/programme which has been undertaken. It may also be defined as the ultimate change in the conditions of beneficiaries resulting from a project/programme. Examples include changes in the actual living standards among project beneficiaries flowing from the project, e.g. increased income, improved nutritional status, increased literacy rates, wider participation by target groups in development planning and decision-making, increased capacity for self-reliant and self-sustained development of beneficiary groups. Impact thus may take place at both individual or household level (e.g. changes in income, housing, nutrition, health status), or community level (e.g. socio-economic relationships, devolution of decision-making authority to local level for effective beneficiary participation).

Some elements of impact may begin to emerge during implementation (e.g. increased employment, incomes and nutritional levels). Others, such as literacy rates or capacity for self-sustained development, by their nature will evolve usually some years after a project's completion (i.e. at a project's full development).

It should be pointed out, as the discussion of the concepts of output, effects and impact would also have brought out particular in the light of the examples cited, that the distinction between the three concepts depends on the nature, scope and size, and, above all, the specific objectives of a project or programme.

Monitoring is the continuous or periodic surveillance (oversight, review) over the implementation of an activity (and its various components) to ensure that input deliveries, work schedules, targeted outputs and other required action are proceeding according to plan.

The purpose of monitoring is to achieve efficient and effective project performance by providing feedback to project management at all levels in improving operational plans and in taking timely corrective action in case of shortfalls and constraints, if any, in implementation of each project as a whole. Monitoring, thus, is a part of the management information system and is an internal activity. As an integral component of the management function, and hence an essential part of good management practice, monitoring needs to be conducted by those responsible for project/programme implementation at every level of the management hierarchy.

Evaluation is a process which attempts to determine as systematically and objectively as possible the relevance, effectiveness and impact of activities in the light of their objectives. It is a learning and action-oriented management tool and an organization process for improving activities still in progress and future planning, programming and decision-making[1].

Evaluation, in the context of rural development projects, which by definition have a poverty-alleviation orientation, is concerned with the assessment of effects (benefits or disbenefits, i.e., immediate objectives) and impact (long-range objectives) on the beneficiaries, preferably classified into various income groups. Its concerns are: who or which group has benefitted (or has been adversely affected), by how much (compared to the situation before the activity), in what manner (e.g. directly, indirectly), and why (establishing causal relationships between activities and results).

1| Evaluation is to be distinguished from "appraisal" which is ex ante evaluation, that is to say, "the critical assessment of the relevance, feasibility and potential effectiveness of an activity before a decision is made to undertake that activity or to approve assistance for it (JIU)".

Whereas "monitoring" is carried out only during implementation, evaluation is carried out:

(i) during implementation (on-going evaluation);
(ii) at completion (terminal evaluation); and
(iii) several years after completion when the activity is expected to have reached its full development and hence the full impact (long-range objectives) of the activity is expected to have been realised (expost evaluation).

On-going evaluation is the continuing analysis during implementation of the relevance and present and likely future outputs, effects and impact of a project. It can assist decision-makers by providing information for any needed adjustment of objectives, policies, implementation strategies, or other elements of the project, as well as for future planning.

On-going evaluation examines whether the assumptions or hypotheses made during the project formulation|appraisal stage are still valid, or whether adjustments are required to ensure that the overall project objectives will be achieved. For example, in some cases, the assumptions underlying the design may have been wrong; in other cases, unforeseen factors, external or internal, may have intervened; and still in some other activities, the objectives themselves may require redefinition or sharpening of focus in the light of experience gained since the initiation of an activity.

The purpose of expost evaluations is two-fold:

(i) to assess the achievement of overall results of the project in terms of outputs, effects and impact; and

(ii) to learn lessons for future planning, i.e. the design or formulation, appraisal, implementation, and monitoring and evalaution of development activities in the future.

Evaluation is therefore to be viewed as a learning process, the assumption being that the process of national development, particularly with respect to rural development, is still largely an unexplored area where much has yet to be learnt about the dynamics of rural societies by both planners and decision-makers. "The very process of carrying out and evaluation can be just as important as the conclusions drawn, since involvement in the process itself often induces a better understanding of the activities being evaluated, and a more constructive approach to their implementation and to any future action required"[1/].

Both monitoring and evaluation are tools for the analysis of data and relevant information for decision-making. Administrative reports, such as progress reports on physical and financial inputs and outputs, supplemented by investigative studies or in-depth analyses of persistent problem areas, provide the information base for monitoring. Monitoring analyses, supplemented by additional in-depth studies, provide the information base for on-going evaluation. In turn, the two together, supplemented by additional data related to the socio-economic status and well being of the beneficiaries before and after the project, provide the information base for expost evaluation. It is in this way that both monitoring and evaluation are related, and together form a unified system.

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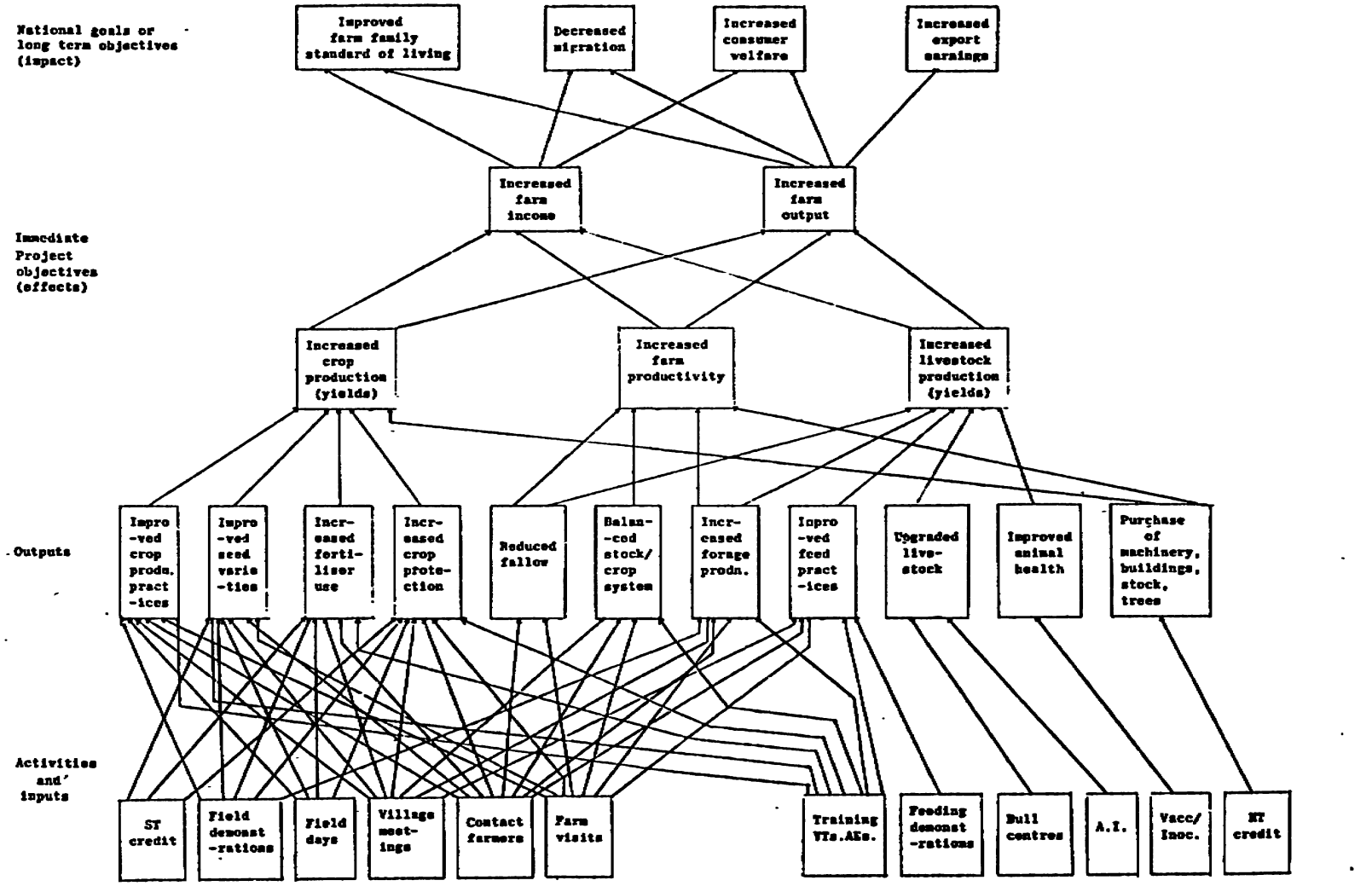
1/ Health Programme evaluation, Guiding Principles, WHO, Geneva, 1981, p. 11

ANNEX II

OBJECTIVE STRUCTURE CORUM-CANKIRI RURAL DEVELOPMENT PROJECT,* TURKEY




* (Extension and Credit Components only)

Source: Design of Monitoring and Evaluation Systems: a training case study of an agricultural extension and credit project. FAO, Rome, 1985 (mimeo)

## ANNEX III

### Examples of Participatory Forestry Projects Forms

**PROFORMA**

**ANNUAL NURSERY RETURN**
**YEAR**

1. Name and location of nursery _____
2. Year of establishment _____ 3. Net seedling bed area _____ ha

4. Seedling production and disposal

| Species | Production ('000) | Disposal ('000) | | | | |
|---|---|---|---|---|---|---|
| | | To private individuals | To Dept. Undertakings | | All other organizations | Total |
| | | | Woodlots of all types | Strip and RDF plantings | | |
| a _____ | | | | | | |
| b _____ | | | | | | |
| c _____ | | | | | | |
| d _____ | | | | | | |
| e _____ | | | | | | |
| f _____ | | | | | | |
| g _____ | | | | | | |
| h etc _____ | | | | | | |
| Total | | | | | | |

5. Distribution to private individuals by size of sale

| Number of seedlings per 'sale' h/ | Number of 'sales' |
|---|---|
| 1 - 100 | |
| 101 - 500 | |
| 501 - 1 000 | |
| 1 001 - Plus | |
| Total | |

1/ Source: R.H. Slade and H. Noronha, et. al (1984) An Operational Guide to the M&E of Social Forestry in India.

ANNEX III (cont'd)

## PROFORMA VILLAGE WOODLOT RECORD

Location: _____ Village _____ District _____ Climate: a) Rainfall: _____ (Annual average)
b) Temperature: Max. _____ Min. _____
Soil: _____

1. Technical features

Type: _____
Size (ha): _____
Formation: _____ (Year)
Design: _____
i) Fencing: _____
ii) Technique: _____

2. Species planted

| No. | Local name | Botanical name | Spacing (H/rs) | No. of plants |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |

3. Survival and growth

| | | 1981 | | | 1982 | | | 1983 etc. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | Local name | Percentage survival | Average height(m) | Average Girth(cm) | Percentage Survival | Average Height(m) | Average Girth(cm) | Percentage Survival | Average Height(m) | Average Girth(cm) |
| 1. | | | | | | | | | | |
| 2. | | | | | | | | | | |
| 3. | | | | | | | | | | |
| 4. | | | | | | | | | | |
| 5. | | | | | | | | | | |

4. Management features

Woodlot established by: _____
Woodlot managed by: _____
Management agreement signed by (date): No. agreement:
Guarded by: Unguarded ( ) Paid ( ) Unpaid ( )

5. Estimated production:

| Item | Sales (Rs.) | Year | Quantity |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

6. Other remarks:

_____
_____

ANNEX III (cont'd)

PROFORMA STRIP PLANTATION RECORD(SP)

Location: _____NH/SH/DR/TR/PR/C/P Taluk/Block _____ District _____ S. Nos. _____
_____Range Division _____
Soil type: _____ Has any agreement concerning the sharing of forest produce/management been made: Yes ( ) No ( )
If yes, give date of agreement and brief details: _____
_____

Technical features

Type: (brief description)
Size: Target ____ha (= kms): Actual _____ ha (= kms)
Formation: (Year)
Design: _____
1) Protection _____; none ( )
2) Technique _____
3) No. of rows _____

Management: guarded ( ) FD/VP paid ( ) unpaid ( ) unguarded ( )

Species:

| | | | | | 1982 | | | 1983 | | | 1984 etc. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Local name | Botanical name | Spacing(m) | No. of plants | %survival | AH(m) | AC(cm) | %survival | AH(m) | AC(cm) | %survival | AH(m) | AC(cm) |
| 1. | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | |

| Employment (days) | 1982 | 1983 | 1984 |
|---|---|---|---|
| (a) Men | | | |
| (b) Women | | | |
| (c) Children | | | |

Other remarks: _____
_____
_____

ANNEX III (cont'd)

## PROFORMA REHABILITATION OF DEGRADED FOREST RECORD (RDP)

Location _____ Taluk/Block _____ District(s) _____ S. Nos.
WP _____ Block _____

Are there any existing rights or concessions? Yes ( ) No ( ) If yes, describe briefly _____

Is there are any agreement for sharing of forest produce? Yes ( ) No ( ) If yes, give brief details _____

Are there any settlements within RDP? Yes ( ) No ( ) If yes, specify briefly _____

### Technical features

Type: (brief description) _____
Size: Target ____ ha (= kms); actual _____ha (= kms)
Formulation: (year) _____
Design: _____

1) Protection
2) Technique (planting series)

Management: guarded: ( ) PD/VP paid ( ) unpaid ( ) unguarded ( )

### Species

| | | | | 1982 | | | 1983 | | | 1984 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Local name | Botanical name | Spacing(m) | No. of plants | %survival | (AH(m) | AG(cm) | %survival | AH(m) | AG (cm) | %survival | (AH(m) | AG (cm) |
| 1. | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | |

| Employment (days) | 1982 | 1983 | 1984 |
|---|---|---|---|
| (a) Men | ____ | ____ | _____ |
| (b) Women | ____ | ____ | _____ |
| (c) Children | ____ | ____ | _____ |

Other remarks _____

ANNEX III (cont'd)

PROFORMA

FORESTRY PRODUCE PRICES FOR THE MONTH OF 19

ZONE: _____

PRICES

| Commodity | Rural areas | | | | | | | | | | Urban area | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Center 1 | | Center 2 | | Center 3 | | Center 4 | | Gov. Depot | | Center 1 | | Gov. Depot | |
| | Unit | Price | Unit | Price | Unit | Price | Unit | Price | Unit | Price | Unit | Price | Unit | Price |
| 1. Grass | | | | | | | | | | | | | | |
| 2. Fuelwood | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| 3. Poles | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| 4. Small timber | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| 5. Timber | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | |

ANNEX III (cont'd)

PROFORMA

FORESTRY PRODUCE PRICES BULLETIN FOR THE MONTH OF _____ 19

LOCATION: (rural/urban/commercial)

| Commodity | Previous year | | | January | February | March | April | May | June | July | August | September | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Av. | | | | | | | | | | | | |
| 1. Grass | | | | | | | | | | | | | | | |
| 2. Fuelwood | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| 3. Poles | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| 4. Small timber | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| _____ | | | | | | | | | | | | | | | |
| 5. Timber | | | | | | | | | | | | | | | |
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# MONITORING AND EVALUATION OF THE COMMUNITY FORESTRY PROJECT IN NEPAL

by

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## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| CFAD | - | Community Forestry and Afforestation Division of the Department of Forests |
| CFA | - | Community Forestry Assistant |
| CFDP | - | Community Forestry Development Project |
| DTCP | - | UNDP Asia and Pacific Programme for Development Training and Communication planning |
| DFC | - | District Forest Controller, formerly called DFO, Divisional Forest Officer |
| Ha | - | Hectare |
| IDA | - | |
| MEU | - | Monitoring and Evaluation Unit, same as MEvU |
| M&E | - | Monitoring and Evaluation |
| PF | - | Panchayat Forest (community plantation) |
| PFF | - | Panchayat Forest Foreman (nursery foreman) |
| PFW | - | Panchayat Forest Watchers |
| PPF | - | Panchayat Protected Forest (existing forest) |
| TG | - | Technical Gazetted Officer |
| UNDP | - | United Nations Development Programme |
| # | - | Number |

## 1. INTRODUCTION

As a system of planned feedback, monitoring and evaluation shows the seeds for its own continuing development. Rural development projects are designed to induce change. Monitoring and evaluation systems are designed not only to measure and evaluate that change but to modify the way projects effect change. Responsive and flexible project management is thus a prerequisite to the effective use of monitoring and evaluation. And since changes in project implementation necessitate changes in the methods for its monitoring and evaluation, the need for flexibility and change extends to the system of monitoring and evaluation itself.

The following case study describes the system of monitoring and evaluation designed for the Community Forestry Development Project in Nepal. At the time of writing, the system has been in operation for over three years on a project that is almost four years old. While the basic features of the system have remained intact, revisions continue to be made. Some of these revisions have come through the feedback loop described above; others have originated in outside events; but the majority of changes have come from experience in implementing the system itself. By paying particular attention to lessons underlying these changes, we hope that this case study can provide guidelines to other forestry projects where benefit to rural communities is the primary goal.

## 2. PROJECT BACKGROUND

The alarming depletion of Nepal's forest resources became a matter of urgent national and international concern during the late 1970s. Realization of the downstream effects of the flooding and soil erosion hastened by rapid deforestation of the Himalaya combined with a heightened consciousness of the indispensible role of forest resources in the livelihood of the overwhelmingly rural population of Nepal. This awareness helped to focus attention on ways to arrest this devastating trend. Encouraged by pilot efforts in the Chautara Forest Division in Nepal and the international initiatives in forestry for local community development (including social forestry projects in neighboring countries), Nepal decided to embark upon an ambitious programme for community forestry with the aid of the World Bank, FAO, UNDP, and various bilateral donor agencies.

The framework for a comprehensive community forestry programme was established by the passage of new regulations under the overall rubric of "Panchayat Forestry". This innovative legislation reversed many of the provisions of the previous forestry nationalization act of 1957 by providing for the establishment of two new kinds of community managed forests or woodlots. Panchayat Forest (PF) plantations can comprise a maximum of 125 hectares for each of the 4,000 Village Panchayats, which are the smallest administrative units in rural Nepal. These community woodlots would be established on (usually) bare government grazing lands with government assistance but all of the benefits going to the local community. Similarly, but more radically, existing forest blocks up to a maximum of 500hectares in the

hills can be handed over to local panchayats with all except 25 percent of the timber sale benefits accruing to the community. These existing community forests are legally recognized as Panchayat Protected Forests (PPFs).

Based on this legal framework, the HMG/World Bank Community Forestry Development and Training Project was designed with the assistance of an UNDP/FAO preparatory project followed by FAO and World Bank missions. The community forestry development component of this project was provided with financial assistance of approximately US$ 15 million through IDA credit and additional technical assistance by FAO through a UNDP grant of US$ 2 million. The project officially commenced in September of 1980 and currently operates in 29 hill and mountain districs of Nepal - roughly half of the total hill districts in the country

As outlined in the World Bank and UNDP/FAO project documents, the objectives of the community forestry project are to:

(1) Provide for the basic needs hill communities for forest resources by increasing the production of:

- fuelwood
- fodder
- timber and poles
- secondary forest products

(2) Decrease the consumption of fuelwood through the development and distribution of improved efficiency wood fuel burning stoves;

(3) Promote self-reliance among hill communities through their active participation in the management of their forest resources; and

(4) Reduce environmental degradation and conserve soil and water resources.

These stated objectives and the project components established to achieve them implic a set of corollary objectives which have been identified to assist the monitoring and evaluation of the project. These include:

- to shift predominant management responsibility for community hill lands from the Forest Department to local communities,

- to change present forest product exploitation patterns by local people into ecological sound management systems,

- to change present grazing and livestock management patterns by increasing stall feeding, introducing range management and decreasing destructive grazing,

- to increase amount, intensity and usefulness of forest resource yield, and

- to change present grass regeneration patterns such as the use of fire in hazardous areas.

To carry out these objectives a new division for Community Forestry and Afforestation (CFAD) was established within the Forest Department. As depicted in Table 1, this Division is composed of six units, including the separate Monitoring and Evaluation

Unit (MEvU). In the field, the project is implemented by the regular District Forest Controllers (formerly called Divisional Forest Officers) who also have their traditional territorial duties. These DFC officers are assisted by a new cadre of forestry extension workers, called Community Forestry Assistants (CFAs). As shown in Table 2, these CFAs work at the panchayat level and are responsible for conducting field activities together with the local village committees and farmers.

The main project components and their targets as established during appraisal consist of the following:

Construction and operation of 340 panchayat nurseries and an additional 68 forest district and range nurseries;

Establishment of 11,750 hectares of Panchayat Forest plantations in these 340 panchayats;

Establishment and management of 39,100 hectares of Panchayat Protected Forests;

Distribution of 900,000 seedlings to local farmers for planting on their own land; and

Development and distribution of 15,000 improved wood-fuel burning stoves.

In support of these field activities, the project also includes prespecified targets for office and quarters construction, vehicle and horse procurement, radio transmission set procurement, and the like. Technical and administrative support to the field is provided by the CFAD. In addition, extensive motivational and educational materials and programmes have been developed as an integral part of the project extension component. Training courses are held annually at all levels to provide the new orientation towards working with and for people and the skills required to carry out these activities.

Annexes IV and V summarize the progress of the project in achieving these goals by the end of the 1982-1983 fiscal year.

TABLE 1: Organization of Project Management as of April 1984

| OFFICES | STAFF | ADVISORS |
|---|---|---|
| FOREST DEPARTMENT | Chief Conservator | Project Coordinating Committee Community Forestry Coordinating Comittee<br>Community Forestry Technical Committee |
| COMMUNITY FORESTRY AND AFFORESTATION DIVISION (CFAD) | Chief,CFAD (TG Class I) | FAO Chief Technical Adviser |
| COMMUNITY FORESTRY UNIT (CFU) | Chief, CFU (TG Class II)<br>1 Asstt. Officer (TG Class III)<br>3 Asstt. Officers (vacant) | FAO Silviculturist/ Ecologist |
| STOVE IMPROVEMENT UNIT (SIU) | Chief, SIU (vacant)<br>2 Asstt. Officer (TG Class III)<br>1 Asstt. Officer (vacant) | Research Centre for Applied Science and Technology Tribhuvan University |
| MOTIVATION AND EDUCATION UNIT (MEdU) | Chief, MEdU (TG Class II)<br>1 Asstt. Officer (TG Class III) | DTCP Bangkok |
| MONITORING AND EVALUATION UNIT (MEvU) | Chief, MEvU (TG Class II)<br>1 Asstt. Officer (vacant)<br>1 Tabulator/ Computer Operator | FAO Socio-Economist |
| AFFORESTATION UNIT (AFU) | Chief, AFU (TG Class II)<br>2 Asstt. Officers (TG Class III) | |
| ACCOUNTS AND ADMINISTRATION UNIT | Senior Accountant (Class III)<br>2 Asstt. Accountants<br>Clerks and Typists | |

TABLE 2: Organization of Field Activities as of April 1984

| LEVEL | OFFICE/STAFF | ASSISTANCE | NUMBER AT OFFICE TO PRESENT | TARGET FOR 198 |
|---|---|---|---|---|
| CENTER | CFAD | National and International Professionals | 10 | 16 |
| DISTRICT FOREST OFFICES (1-3 Districts) Coverage | DISTRICT FOREST CONTROLLERS | | 21 | 29 |
| RANGE NURSERY: FOREST DISTRICT AND RANGE NURSERIES | FOREST RANGERS DISTRICT AND RANGE NURSERY FOREMEN | | 33<br>50 | 36<br>54 |
| | | Volunteers/ Associate Experts | 14 | 15 |
| VILLAGE PANCHAYATS | COMMUNITY FORESTRY ASSISTANTS (CFAs) | | 90 | 108 |
| | | Pradhan Pancha/ Forest Committees | 337 | 340 |
| PANCHAYAT NURSERY | PANCHAYAT FOREST FOREMEN (PFF) | | 337 | 340 |
| PANCHAYAT PROTECTED FOREST(PPF) | PANCHAYAT FORESTS (PFW) | | | |
| PANCHAYAT FOREST (PF) PLANTATION BLOCKS | PANCHAYAT FOREST WATCHERS (PFW) | | approx. 375 | approx. 1000 |

## 3. NATIONAL AND INSTITUTIONAL CONTEXT FOR SYSTEM DESIGN

Systematic methods for monitoring and evaluating projects and programmes have not yet been widely implemented in Nepal. At the national level, monitoring has been confined to a system of physical progress reports based on expenditure submitted at the end of each budget trimester and at the end of each financial year. These are aggregated by sector and reviewed by indiviudal ministries, the National Planning Commission, and the National Development Council. These reports weigh outputs according totheir cost and enumerate only those targets which consiture a budgetary line item. Progress is measured in terms of the percentage of allocated budget spent. In addition to this national level system, some individual projects have initiated efforts to establish their own systems for monitoring and evaluation.

In designing the M&E system for the Community Forestry Project, we were concerned to integrate it as much as possible with the existing national monitoring system. However, it was apparent that this system is much too limited for serving project needs. On the one hand, it does not distinguish adequately between actual field activities and supporting activities. For example, since building construction and radio transmission procurement, although supporting activities, represented almost half the budget in the initial two years, the national progress monitoring system gave the project poor marks for progress when these components lagged behind even though most of the field activity targets such as planting and seedling distribution were exceeding their targets. Also, we found the system inadequate for our purposes for the more important reason that it does not take into account what happens to the outputs once the budget has been expended and the fiscal year completed. That is, it does not include even rudimentary procedures for evaluating the benefits, effects, and methods adopted by the projects. For these reasons, it was necessary to establish a separate M&E system that retained, where possible, the same categories used by the national progress reporting system, but considerably expanded its scope and methods.

The amount of expansion possible was primarily constrained by staff availability. Although the World Bank loan had made provision for hiring an average of 48 man - months of enumerators anually, government regulations for hiring temporary staff did not permit us to offer salaries competitive with private research firms and made no provisions for covering the daily living expenses and hardships of field research in the roadless mountains of Nepal. In addition, the lack of permanent positions and career opportunities for social scientists and statisticians in the Forest Department hampered the possibility of hiring non-foresters with these backgrounds to serve within the M&E Unit. Aside from one UNDP financed contract for the baseline study with a private firm and a computer operator/ tabulator, we were thus compelled to design a system which could be implemented with existing forestry field staff -- the Chief of the Unit and FAO advisor, and the forestry volunteers provided by various bilateral agencies. M&E costs range from 1% to 3% of total budgeted project costs depending on how technical assistance costs are apportioned.

The administrative culture within which the M&E system had to be designed and operated derives, in part, from Nepal's situation as a Least Developed Country of 16 million people with an average per capita income of less than U.S. $140. While government jobs are sought after for their security, the monthly salary of field officers and technicians is less than $100; the duty stations frequently require two to three days walk from seasonally served airstrips or fairweather roads; the physical conditions of life in the field are harsh; and promotion is generally perceived as having little relation to performance. As many observers have remarked, this situation has encouraged bureaucratically conservative behavior where the most successful strategy for government employees is to avoid decisions which would jeopardize their sinecure.

With the majority of the population still illiterate, Nepal also represents a predominantly oral culture in which the written medium was, until very recently, reserved for records (such as land ownership) and scriptures considered to be of a relatively permanent nature. Written communications are understood as legal documents for which the writer can be held accountable. There is thus a marked preference for dealing with problems and unresolved issues first on an oral basis, and then only recording the results after a resolution has been found. Informal and ad hoc methods of identifying problems and evaluating programs through oral communication has thus been usually the only means, aside from the budgetary national progress reports noted above, for monitoring and evaluation - a means which has been reinforced by the prevailing administrative and cultural conditions. While trying to enable as much continuing use of the oral channel of feedback as possible, the monitoring and evaluation system developed by the project has had to contend with the fact that it represents an expansion of written modes of communication and assessment which is a departure from traditional norms.

## 4. OBJECTIVES OF MONITORING AND EVALUATION SYSTEM

The establishment of a separate monitoring and evaluation unit within the structure of project management reflects the emphasis placed on these activities during project design. Since the nature of the project itself was so innovative for the forest department and the country, it was decided that monitoring and evaluation would be crucial to improving project management and finding out what was happening in the field.

The M&E system was thus designed with the following explicit objectives in mind.

(1) To improve project performance by:

- Providing timely information to management and implementing units on project operation and performance (inputs and outputs), with implications for support requirements;
- generating socio-economic information required for effective project implementations.
- identifying and anlysing problems arising during implementation and suggesting possible solutions;
- increasing people's communication with project staff and participation in project activities.

(2) Evaluate project results and improve future planning processes through:

- measuring project effects and impacts;
- identifying and analysing factors affecting project success;
- evaluating project concepts, assumptions and models in light of actual performance and rural conditions.

## 5. DATA REQUIREMENTS AND INDICATORS

The data required to meet these monitoring and evaluation objectives were (and still continue to be) identified through a variety of different approaches.

(1) A formal system analysis approach was initially used to list each of the project activities in relation to the stated and implicit project objectives and identify each of the outputs, effects, and impacts logically related to these activities. The "logic" of associating various effects with different activities is based on assumed causal relationships between the project's activities and the objectives they are intended to foster. As one moves from outputs to long term impacts, the causal links become more complicated and tenuous as more and more extraneous factors impinge on the assumed causal relationships. For this reason, project effects were divided into categories of "direct effects", "indirect effects", and "long-term impacts".

Indirect effects stem directly from the project's implicit objectives. They are the result of behavioral changes induced by the project, rather than a direct outcome of specific project activities. These indirect effects merge into long term impact, which focus on an improved standard of living through the improved supply and management of forest resources within a self-sustaining ecological environment. These constitute the ultimate objectives of the project and, like indirect effects, are the expected outcome of the project as a whole rather that any one activity.

For each set of systematically identified outputs, effects, and impacts, the means and unit for measuring them were also listed. These indicators vary from those which are directly measurable (e.g. number and size of seedlings) to those which must be indirectly measured by proxy variables. The use of these proxy variables rests on assumed causal variation between the measurable indicator and the unmeasured "true value". Since the project was designed with a twenty-year time horizon, and some forestry effects and impacts can only be directly measured after thirty years of tree growing, only those indicators which can be measured within a five-year period have been identified. The further along the causal chain from outputs to impacts one moves, the more proximate, indirect, and inconclusive are the indicators that can be used for measurements.

The comprehensive list of the identified project outputs and effects together with their accompanying indicators is presented in Annex I. A few examples of each category of indicator are given below:

Outputs: project targets such as hectares planted, number of nurseries constructed, seedlings distributed, management plans drawn up, improved stoves distributed, etc.

Direct Effects: amount of grass cut from plantations, survival of seedling by species, amount of natural regeneration, degree to which improved stoves are used and estimated fuel savings, etc.

Indirect Effects: hectares under operational community management, change in grazing patterns, income to local panchayat, etc.

Long-Term Impacts: increased income through increased agricultural yields and decreased time spent on wood collection, increased environmental stability, etc.

As indicators of project success as a whole, key indicators were also identified as a kind of summary of many of the individual indicators. In aggregate form these are as follows:

(a) Total number of trees planted and surviving in private land and community forests (PF and PPF);

(b) Number and amount of forest area brought under adequate local management as community forests (PF and PPF);

(c) Decreased wood fuel consumption due to increased wood use efficiencies;

(d) Increase in knowledge and participation in community forestry activities.

While not directly relatable to specific outputs and effects, supporting inputs and activities are to various degrees indispensable components of the project. As listed in Annex I, these inputs include staff, technical assistance, vehicles, equipment, budget, etc. Indicators for the physical provision of these inputs are specified in project documents and annual budgets. However, since judgements of job performance and the efficiency with which supporting inputs are used are the responsibility of project management and outside review and evaluation teams, no specific indicators are identified for the effects of of these activities aside from those associated directly with project field activities as a whole.

(2) Other considerations aside from a systematic identification of all inputs and outputs with their corresponding effects, impacts, and indicators have played an important role in determining the actual data requirements for the M&E system. The list of potentially relevant indicators listed in Annex I has been modified, focused, and curtailed in order to conform to project priorities and the constraints under which the system must function.

Data priorities have been identified by the consumers of the information and findings generated by the M&E system. These include field implementing officers (DFOs), Project Management, the Department of Forests, the Finance Ministry and Accountant General's Office, the National Planning Commission, the Rastriya Panchayat (National Legislature), and the donor agencies -- particularly the World Bank and UNDP. The identification of these priorities is a continuing interactive process. While initial data collection schedules were determined in consultation with project management and field officers prior to incorporating them in the system, feedback from other concerned agencies would appear when the issue came up: in review meeting, in supervision missions, in problem-solving, etc.

Staff and skill constraints have already been discussed as part of the context within which the system had to be designed. The most important of these constraints are: the lack of manpower specifically for M&E, the unfamiliarity with systematic data collection requirements, the reluctance to commit certain forms of communication and reporting to writting, and lack of training in sampling and surveying techniques. In different ways these constraints shaped data requirements by eliminating those indicators and variables which were too difficult to measure or too difficult to collect. While this sometimes meant eliminating indicators which were otherwise a priority for M&E consumers, it also served as a strong rational for eliminating marginally useful information which would have only over-loaded the system, and delayed timely processing.

Data requirements thus became a function not only of what should logically be collected and measured, but also of relevance, measurability, feasibility, timeliness, and simplicity. These various considerations necessarily involved trade-offs as well as constant changes.

## 6. COLLECTION OF MONITORING INFORMATION: METHODS AND PROBLEMS

The distiction between monitoring and evaluation necessarily is blurred by the overlapping collection of some information for both purposes. In the system of M&E developed for the community forestry project, we have referred to monitoring information as the collection of data in regular reports which are primarily concerned with keeping track of inputs and outputs. However, these reports also serve as a vehicle for trasmitting other kinds of information, including some which we would term evaluation data, and some which is operational in nature (e.g. the request for additional supplies or support from the central CFAD office).

The monitoring system is designed so that all of the necessary data can be provided by regualr forestry staff involved in project activities. The Distric Forest Controllers are responsible for providing district level information for each of the 29 districts participating in the project. The Community Forestry Assistants and participating Rangers are entrusted with providing panchayat level information forwarded through the DFC office. Ad hoc cross checking and the development of data adjustment coefficients (where systematically biased reporting is detected) are provided by CFAD central staff through field trip reports. During the initial years, duplicated core output information is also provided by the 10-15 volunteers and Associate Experts (V/AEs) working in the field districts - both to ensure availability of information and as a means of checking its quality.

At present, a series of monitoring reports are being used in addition to the existing national trimester (thrice-yearly) and annual progress reports, described earlier, which each DFC should send to CFAD for compilation and forwarding to the Minsitry and National Planning Commision. These additional monitoring forms have retained, where possible, the same overall budget headings to facilite transfer of information from the progress reports. However, they include more detail on actual field activities to provide project management with the information they need. The forms also include several indicators and information requests which are intended primarily as planning tools to remind project staff about types of field activities they should continue to perform on a timely basis (such as extension meetings, seed collections, etc.).

Table 3 lists the various reports that make up the formal monitoring system. At different levels of specificity, each of these reports are concerned with both targeted and untargeted project activities. In the case of activities for which annual and project-period targets have been established, achievement is measured both numerically and through percentage of the target accomplished. Financial information is now (though not originally) requested from the DFC alone according to the budgetary categories and the funds allocated. Representative examples of these monitoring report formats are presented in Annex II. It should be noted that the Volunteer/Associate Expert and CFAD headquarters staff reports are virtually identical and overlap on many of the items with the regular forestry field staff.

TABLE 3: MONITORING REPORTS

| REPORT | FREQUENCY | LEVEL |
|---|---|---|
| District Forest Controller: | | |
| HMG Trimester Progress | Trimonthly | District |
| HMG Annual Progress | Annual | District |
| Annual Monitoring for CFDP | Annual | District |
| Trimester Monitoring for CFDP | Trimonthly | Panchayat |
| Community Forestry Assistant/Ranger: | | |
| 1st/2nd Trimester Monitoring for CFDP | Biannually | Panchayat |
| Annual Monitoring for CFDP | Annual | Panchayat |
| Volunteers/Associate Experts: | | |
| Monthly Report | Monthly | District |
| Panchayat Specific Information | Biannually | Panchayat |
| Annual Monitoring Report | Annual | Dist/Panch |
| Stove Promoters: | | |
| Stove Installation Inspection | Once only | Household |
| CFAD Headquarters Staff: | | |
| Field Trip Report | Ad hoc | District |
| Panchayat Specific Information | Ad hoc | Panchayat |

The data for these reports are collected in the field on the basis of information obtained from physical inventories, written records, and interviews with panchayat level workers and Forest Committee members. In the course of implementing the project, it became evident from both and operational and monitoring point of view that complete records were necessary at the panchayat level. These records were introduced in the form of printed registers and, when adequately maintained, provide almost all the information necessary for the monitoring reports. With the assistance of these records, it is estimated that the time required for collecting and completing the monitoring reports should not be more than 2 working days per year for the DFC and 3 working days per trimester (9 days per year) for the CFAs. This estimate excludes the considerable time CFAs must spend walking between panchayats as these site visits are required as part of his operational duties and no additional walking is required for M&E.

Table 4 gives a list of the registers maintained at the panchayat level that contain the information needed for the monitoring reports.

TABLE 4: LIST OF PANCHAYAT LEVEL FIELD REGISTERS

| REGISTER/RECORD | RESPONSIBLE STAFF | ASSISTING STAFF |
|---|---|---|
| Nursery Operation Plan | CFA/Ranger | PFF |
| Nursery (Operations) | CFA/Ranger | PFF (foreman) |
| Seedling Distribution | CFA/Ranger | PFF |
| Plantation (and Maintenance) | CFA/Ranger | PFF + PFW |
| PF + PPF Managemente Plan | DFC/CFA | Forest Committee |
| Improved Stove Distribution | Stove Promoter | Installers |
| Stove Monitoring Form | Stove Promoter | -- |
| Annual Target Distribution | DFC | CFA + AE/V |
| PF Handing Over | DFC | CFA |
| PPF Handing Over | DFC | CFA |

The principal problem encountered in implementing the system of monitoring information collection has been the difficulty in obtaining the required information from all of the actors involved on a timely and complete basis. At the bottom of the information ladder, this difficulty stems in part from the failure to maintain all registers adequately - either because the panchayat level worker (PFFs and PFWs) are illiterate or because there has been insufficient supervision and record keeping by the CFAs. Some CFAs, in turn, have also not taken the responsibility of completing monitoring forms seriously or are still unsure of how to do so despite training sessions devoted to the subject in the annual CFA training. Also, they, like some DFCs posted to remote districts, may be absent from post and/or reluctant to commit themselves in writing to the progress that has been achieved without first hand inspection. Concern that the figures reported may also be used for auditing purposes in which descrepancies could be attributed to misuse of funds also plays a role in keeping some field staff from submitting reports on a timely basis. As noted earlier, the completion of systematic monitoring reports is not part of the traditional job description and runs counter to cautious bureaucratic norms.

The sheer physical difficulties of communication have also played an important role in the difficulties of receiving timely monitoring reports. The turn around time for mail to many of the districts is one month. If there is added to this the time it takes for a DFC to communicate with each of his CFAs who are frequently spread over the district several hard days walk away from his office (and sometimes up to four days walk away), it can be seen that communication can easily take up to two months even if everybody is at post at the time.

Despite these difficulties, the annual monitoring information at the district level has been completely collected each year within six weeks of the close of the fiscal year in time for the annual report. While panchayat level information has some gaps, that too has largely been completed over time. With the installation of the belatedly received transceiver radio sets, it is hoped that this problem will be further overcome. However, the existence of this difficulty has reinforced the wisdom of using multiple sources of information for ovelapping core monitoring data.

## 7. EVALUATION SURVEYS AND STUDIES

The evaluation surveys used by the community forestry project take up where the monitoring reports leave off. These surveys are concerned to find out what happens after the budget has been expended and the immediate outputs produced. While some surveys are conducted only once, others are repeated on an annual basis. The immediate purpose of the regular surveys is still a kind of on-going monitoring in that they are used by project management to adjust and modify the project's implementation. However, they also serve more long term evaluation functions by examining the social and economic context and assumptions of community forestry and provide information which is currently being used to design the second phase of the World Bank funded project.

Table 5 lists the regular surveys which we have categorized as "on-going evaluation":

TABLE 5: ON-GOING EVALUATION SURVEYS

| SURVEY | FREQUENCY | SURVEYERS |
|---|---|---|
| Plantation Survival | Annual | V/AE - CFA |
| Private Planting | Annual | V/AE - CFA |
| Improved Stove Use | Annual | Stove Promoter ( + some V/AE) |

The plantation survival survey is conducted each year during the late spring in order to determine survival rates following the dry season, but after the deciduous species have regained their leaves. At present the surveys are mostly conducted by the Volunteers and Associate Experts but it is planned that this task will continue to be transferred to the CFAs - perhaps by appointing one CFA for each District to be in charge of monitoring and evaluation. An attempt is made to cover all of the plantations in each District. However, all districts do not have V/AEs to carry out this survey, and due to normally occurring volunteer and staff turn-over and illness, we have found it more reasonable to expect about 50 percent coverage in any given year.

Within each plantation a sample of between 1 000 to 2 000 pits planted with seedlings are counted. The suggested sampling method is to use at least five evely spaced contours with a random start. Walking along each countour, one or two rows of seedling pits are then observed and recorded in a worksheet.

In addition to determining overall plantation survival, this survey seeks to determe survival rates according to species, site conditions, altitude, etc. and identify the causes for seedling mortality in descending order. These causes have been classified as primarily social (e.g. grazing, fire) or technical (e.g. size of seedling at planting, species suitability for site, planting method, insect damage, etc.). The pre-coded data collection format for this survey is reproduced in Annex III.

The only real difficulties encountered in implementing this survey have concerned determining survival by species. The lack of systematic distribution of different species within plantation areas and inadequate records regarding exactly how many of different species were originally planted or replaced has sometimes made it difficult to calculate individual species survival rates with much confidence. It is partly for this reason that plantation registers were introduced during the third year of project implementation.

The private planting survey, conducted in the late fall or early spring, is concerned with what happens to the tree seedlings which have been distributed to individual households. At present it is also mainly conducted by the Volunteers and Associate Experts, but CFAs are receiving on-site training during the process.

Given the lengthy time required to walk to randomly selected households throughout the district as well as the lack of complete distribution registers for earlier years in some panchayats, a two-stage sampling procedure has been adopted. At the first stage, panchayats from each year of operation are selected according to probability proportional to size of distribution (the number of receiving households and institutions). At the second stage, seedling receivers are randomly selected from the distribution list maintained at the nursery. This procedure provides for self-weighting samples up to the district level.

The data collected in this survey include the survival rate and causes for mortality as in the plantation survey, with additional information on socio-economic variables. The household's economic status, landholdings, and ethnicity are among the independent variables measured. In addition, the survey determines who brought the seedlings, the source of initial knowledge, and the household's desires in terms of the next year (species and number of seedlings desired). The private planting survey data collection form is given in Annex III.

The main problem encountered with the implementation of this survey has been the lack of complete registers for all years at all nurseries. This has resulted in devising a fall-back sampling method in which the panchayats are first selected purposively (with larger distributing nurseries being given more emphasis for inclusion), and the seedling receivers being selected on a random basis in proportion to the size of the distribution list. Surveyors have also experienced some difficulty in the amount of walking required, particularly if no-one is at home when they arrive. However, as a partial compesation for this, many of the Volunteers and Associate Experts have reported that they learned more about local peoples's attitudes towards forestry and the program through these randomly selected visits that they did through any other of their activities.

The improved stove use surveys are conducted by stove promoters during the time when they are not busy with the supervision of distribution and installation -- usually the fall and winter. Since the majority of the stoves have been distributed in Districts accessible from CFAD headquarters by road, it has been possible to train and supervise these promoters in the survey work required. Only in a few of the districts where the promoter's level of education is inadequate or supervision from CFAD difficult, have the V/AEs taken up this responsibility.

In new and remote districts where less than 150 stoves have been distributed per year, a complete census of stove recepients is taken. In the three districts around Kathmandu - where over 2,000 stoves are being distributed this year - a simple random sample of at least 150 stove takers per year is covered by the survey. This sample is drawn from the distribution list maintained by the stove promoter and the DFC office.

Since the stove programme faces more technical and social unknowns than other project components, the resulting survey is longer and covers more aspects of improved stove use. In designing the survey, close coordination was also maintained with other projects distributing stoves such that some of their specific concerns were also added to the questionnaire. In addition to household characteristics which may be relevant to stove use (e.g. economic status, ethnicity, number of members), the survey attempts to measure degree of improved and traditional stove use for different purposes, construction or installation problems, perceptions of fuel savings, and attitudes towards various characteristics of the improved stove in comparison to the previously used cooking method. By carefully disaggregating the degree of stove use for different purposes, the survey is able to make reasonably accurate estimates of actual fuel saving and identify purposes for which the new design is inadequate. The survey's emphasis on the physical condition of the stove also has enabled the project to identify design and construction weaknesses which are fed back into research and development.

The main difficulty experienced with conducting this survey ha been the weakness of using recall methods to determine the user's perceptions of fuel savings. Often the user herself is unclear about the amount she feels has been saved. While these figures are not used in calculating our estimates of fuelwood savings, it would be useful to supplement this survey with a physical measurement study of a subsample of households. A copy of the improved stove use survey questionnaire is included in Annex III.

In addition to these on-going evaluations, various other surveys have been designed and conducted for both evaluation and planning purposes. The list of these additional surveys is presented in Table 6.

TABLE 6: ADDITIONAL SURVEYS

| SURVEY | FREQUENCY | SURVEYERS |
|---|---|---|
| Benchmark Evaluation Surveys | | |
| Baseline/Socio- economic Household and Village Leader Survey | 1982 & 1986? | Contracted |
| Training and Extension Evaluation | 1983 | Field Staff/ DTCP, Bangkok |
| Investigative and Planning Surveys | | |
| Panchayat Characteristics | Each panchayat (once only) | CFA |
| Species Preference | Ad hoc | CFA - V/AE |
| Existing Forest Management | Each plan | CFA - V/AE |
| Private Tree and Traditional Stove Use | 1981 | V/AE - CFA |
| Phase II Project Planning | 1984 | DFC |

The baseline/socio-economic survey conducted during the early spring of 1982 had three objectives:

(1) To identify and analyze prevailing patterns of forest resource use, particularly fuelwood and fodder, in relation to local farming systems in different regions of the country to facilitate project implementation midterm evaluation and future project planning;

(2) To provide baseline data for future evaluation of project effects; and

(3) To identify any measurable effects occurring after two years of implementation.

To meet these objectives, probability proportional to size random sampling was used to sample early participating panchayats (1979-80-), recently selected panchayats (1981-82), and control panchayats in each of the four regions in which the project operates. This gave twelve different sample groups of 75 households and 15 ward (village) leaders for a total of 900 households and 180 ward leaders. A private research firm was contracted to provide for field data collection, coding and raw data tabulation, while design and analysis remained the responsibility of the M&E Unit. It is planned that a repeat of this survey be conducted in 1986 to measure any changes that have occurred.

This socio-economic survey also served to critically examine the context and assumptions of community forestry activities in Nepal by interviewing people on their present practices and attitudes. A number of previous assumptions regarding the low level of knowledge and interest in the issues of deforestation and tree planting were found to be erroneous. Annex VI gives examples of the survey and findings, such as the large amount of tree growing already taking place in rural Nepal and the decrease in fuel consumption when prices are higher. These findings were perceived as actually strengthening the project's chances of success and were used to modify components and species selection to suit actual needs and conditions. (See Section 10)

Aside from the modest training and extension evaluation survey conducted in part by an outside UN supported institution (DTCP, Bangkok), the remainder of the surveys listed in Table 4 have been designed primarily as aids to both local and national planning. They were directed to people living in the project area regardles of whether or not they participated in the project in order to obtain a more complete picture of the existing situation with regard to such matters as private fodder tree planting and harvesting, traditional stove use, etc. As with the baseline socio-economic survey, they served as a check on overall project design assumptions. (See the Project's Field Document No. 5, Data Collection Guidelines for Monitoring and Evaluating Community Forestry Activities in Nepal, by T.N. Bhattarai and J.G. Campbell, 1984 for details on these other surveys).

## 8. PARTICIPATORY EVALUATION AND ADDITIONAL MONITORING AND EVALUATION METHODS

In addition to the formal written system of monitoring and evaluation outlined above, a number of more informal activities serve important M&E functions within the project. These include both semi-structured and unstructured activities which have frequently been instituted for more than just M&E purposes. The multiple roles played by these activities and their informality should not belie their importance to the monitoring and evaluation system and the effectiveness of the project as a whole. Many of them are established as part of the regular management information system even though they also serve a M&E function.

The most structured form of participatory evaluation takes place in the annual District Seminars. These three-day seminars are organized by the DFC with support from CFAD. The elected Panchayat leaders (Pradhan Panchas) and the Forest Committee Chairmen of each participating panchayat are the principal participants. Leaders of the elected district Panchayat and appropriate distric officers (such as the chief District Officer, Local Development Officer) and other representatives (such as the local chairwoman of the Woman's Organization) are also invited to participate in the seminar.

The main purposes of these district seminars are to acquaint participants with details of the program, identify and discuss problems and successes from the perspective of village leaders, and provide additional motivation for active participation. Each seminar includes a one-day field trip to a nearby panchayat arranged by that panchayat's leaders and forest committee to see and discuss activities in the field as well as educational activities such as the showing of film strips and films. At the conclusion of each seminar the panchayat leaders draw up a list of problems and recommended solutions which are passed by the seminar as a whole and forwarded to CFAD headquarters.

Less structured, but equally important forms of participatory evaluation take place during CFAs and DFCs meeting with villagers - both in the village and at the DFC's district office when village leaders visit the district center for various reasons during the year. These are supplemented by frequent field trips made by CFAD headquarters staff to project panchayats in each district in which staff discuss the programme directly with the local people. Although some of hte results of these informal meetings may be communicated in writing through field trip reports or letters, most of them are passed on to project managers through staff meetings and discussions. Like district meetings, these discussions provide important information for M&E which would not be forthcoming through written reports and surveys, as well as serving a management function.

Internal project staff evaluation (a kind of self-evaluation) takes a variety of more or less informal forms. On the more structured side, are a series of annual meetings in which all aspects of the programme are discussed at the same time as any new dimensions may be introduced by CFAD headquarters. These meetings include: the Annual DFC and V/AE Meeting held each fall at headquarters, the Annual Regional DFC and V/AE Meetings at regional centers, the Annual V/AE Meetings at headquarters in the spring, the Annual CFA Trainning Courses in the summer, and regular distric and CFAD staff meetings.

In addition to these meetings, each volunteer and associate expert completes a District Report at the end of his or her two year term. This report is reproduced as a project document and covers all aspects of the project, including the V/AE's personal evaluation of achievements and problems in their assigned districts.

The M&E Unit also conducts a kind of on-going evaluation of processes, problems, and issues which have been identified through the M&E system. This evaluation usually involves short term field research in participating panchayats using qualitative data collection techniques, including interviewing representative villagers and staff and observation of behaviour. Frequently, some research into secondary written materials (such as reports on livestock feed requirements, legal texts, etc.) is also involved in investigating particular issues relevant to the project. These methods are also being used for initial preparation of the project's second phase. While the M&E Unit has considered supplementing this aspect of project evaluation with in-depth case studies, so far the unavailability of funds or staff to carry out these studies has precluded their use.

Outside Evaluation of the project is conducted by the various funding bodies, including HMG, UNDP, World Bank, and FAO. In addition to regular World Bank supervision missions and HMG/UNDP/FAO tripartite reviews, the most significant outside evaluation was the Mid-Term Review of project activities conducted by a joint team with members representing each of these agencies. The results of these evaluations are circulated in the form of reports, discussed in meetings, and the recommendations are incorporated in on-going project modification and implementation. The functioning and usefulness of the M&E system itself has been regularly reviewed through this means. These outside evaluations thus serve to provide a valuable independent perspective which is particularly necessary when M&E is part of the management structure.

## 9. DATA PROCESSING AND ANALYSIS

Data processing and analysis has been conducted entirely by the three staff associated with the M&E Unit; that is, the Nepalese Senior Class II Forestry Officer, the FAO socio-economic advisor, and the Nepalese computer operator/tabulator. Given this limited manpower, and the other demands on our time, we have had to develop relatively efficient systems for data processing and analysis, which relay heavily on the use of a small microcomputer (Apple II Plus with 64k RAM and two floppy disk drives and printers).

Hand tabulation with a calculator continues to be used for aggregating the regular HMG trimesterly progress reports required by the National Planning Commission. This is accomplished by assembling all of the reports received from the DFOs and transferring them in aggregate form to the special Nepali language format required. However, following the completion of the annual compilation, the budget figures are entered into a computer software program for financial spreadsheets (Visicalc) for double checking the figures and producing an English language summary.

Monitoring report data on project outputs is maintained in both written, graphic and electronic media forms. As data are received from the field through monthly, trimesterly, and annual monitoring reports, details regarding the targets achieved are recorded in a set of registers maintained by the Unit Chief and then passed on to the computer operator for filing until the time for the annual report is due. The location of participating panchayats and nurseries constructed is recorded on a large scale wall map using colored pins to represent different types of nurseries and years of construction. At the end of the fiscal year, targets and achievements are entered into the financial spreadsheet computer program for printing and calculating various totals and ratios of achievement (See Annex IV). From this software programme, the data are also transferred to a graphing programme (Visiplot), which outputs various types of graphs to illustrate progress. (See Annex V).

The greatest benefit from using the microcomputer has been in the processing and analysis of the annual on-going evaluation surveys, baseline survey, and other one-time suveys. Data entry and simple tabulation which would otherwise take three to four man months of hand tabulation for each of the on-going evaluation surveys (typically consisting of 300 to 500 survey forms with 30 to 60 variables each) can now be accomplished by the single computer operator/tabulator in one to two weeks with considerably greater accuracy. Part of this efficiency was gained by our learning to develop pre-coded survey forms designed for direct entry via the computer keyboard, thus eliminating the intermediate step of hand tabulation.

The use of statistical software programmes for computer analysis of the survey data has made possible a much more rapid and sophisticated level of understanding of the data obtained. At the simpliest level, a custom package called Statistical Data Processing, permits two way cross-tabulation of variables to produce pre-formated tables with percentage, mean and chi-square values. An example of such a table dealing with survival percentages of plantations is presented in Annex IV. Using a much more comprehensive comercial software package entitled Statistical Processing System, a large number of statistical tests can be interactively performed. This package has been heavily used for multiple linear regression analysis to determine the relative influence of various independent variables on a single dependent variable. One of the most useful applications of this method has been to estimate the relative contribution of different causes for seedling mortaility in which it was found that technical reasons were primarily responsible for low plantation survival rates in Panchayat Forests. Another application identified a very high correlation between number of seedlings taken by a household and its ownership of irrigated land, even though most seedlings are planted on the unirrigated upland areas.

Even if a general statistical programme were available on the recently installed large national computer, it is evident that the increase in cost, loss of flexibility, and competition for time that use of this system would entail, would far outweigh the advantages achieved by the project's having its own microcomputer system for data processing and analysis. The total cost of this system including software, supplies, and repairs over the three years of its operation has been roughly US$ 7 500.

## 10. PRESENTATION AND USE OF FINDINGS

The information and findings generated by the monitoring and evaluation system are communicated to project management, field staff, and other interested parties through a variety of formal and informal means. These include both written and oral methods of communication that are made possible by the inclusion of the monitoring and evaluation unit within the structure of project management. Project management, in turn, incorporates the major findings of M&E in their reports to Government and donor agencies.

Written reports, which include graphic presentation of findings generated by the computer, include the following:

- Annual Progress Report: a summary of project progress and achievements, evaluation findings, and outstanding problems identified under three headings: technical, socio-economic, and administrative.

- Separate reports covering on-going evaluation surveys, the baseline/socio-economic survey, and other surveys where analysis of the data are given more detailed treatment than in the Annual Progress Report.

- Internal circulation of V/AE monthly reports, field trip reports, and other relevant reports received from the field CFAs and DFCs.

- Project Newsletter: a summary of M&E findings are presented in a separate section devoted to this purpose in the project's newsletter which appears approximately four times a year and is sent to all DFCs, V/AEs, CFAs, as well as to the Department of Forestry and other interested agencies.

- Seminar and workshop papers: results presented in some of the reports are rewritten for wider audiences when CFAD staff participate in national and international seminars and workshops.

- Radio program: when appropriate, some results are broadcast in the weekly national radio programme supported by the project.

Of equal, if not more, importance to effective use of monitoring and evaluation information is the M&E's direct participation in project implementation. This participation provides numerous opportunities to feed M&E information directly back to project management and the other units of CFAD at the time when decisions are actually being taken. The forums for this participation include:

- Weekly staff meetings in which issues and problems currently facing the project are discussed with project management.

- Annual Meetings with DFCs and V/AFs discussed earlier.

- Annual training courses for CFAs which are held under the auspices of the Ministry of Forest and Soil Conservation's Training Wing with most of the lectures given by CFAD staff.

- Preparation of annual work plans and budgets in which all of CFAD units are involved.

- Collaboration with other units in their various operational and support work.

- Participation in supervision missions and the mid-term review of the project conducted by the World Bank, UNDP, HMG Nepal, and FAO.

During the three years the M&E system has been operational, it has been gratifying to observe that the information and findings of the M&E system have been used continously by project management and implementers, national level policy makers, auditors and legislators, as well as donor agencies, to effect a number of specific changes in the project's annual targets, motivation and education activities, field procedures, and legal and administrative support. While it is likely that some of the problems these changes address would have become apparent to some extent even without the system, monitoring and evaluation data provided the baiss for documenting and quantifying the importance of specific problems and uncovered others which might not have been noticed. Without in any way attempting to be exhaustive, examples of some of the specific findings and corrective actions taken are given below.

M&E Finding: Annual targets for private planting set during appraisal were considerably exceeded in the field. Source: annual monitoring reports.

Corrective Action: The target and budget for distribution of seedlings was greatly expanded.

M&E Finding: While targets for PF planting were being exceeded, those for PPF enrichment planting were not met and in the opinion of field workers often not necessary.

Source: Annual monitoring reports and annual meetings.

Correlative Action: The target and budget for PF and PPF plantation were amalgamated into one to allow for more of the former and less of the latter in those districts with larger areas available for PF planting.

M&E Finding: The demand and rate of use of improved stoves was high, but early models suffered from cracks particularly on the front lip and the inability to accomodate varying size cooking pots, as well as inadequate maintenance. Source: stove use survey.

Corrective Action: The rapid expansion of the programme was continued but the number of districts covered was limited. The stove was redesigned to strengthen the front lip and improve installation. A layer of mud was added to the top of the stove to increase strength and fit a larger array of pots. A wall chart and illustrations in the distribution register were developed to show proper installation and maintenance methods.

M&E Finding: Knowledge of the availability of free tree seedlings among average villagers was confined to only half the panchayat's population after two years of operation. Source: socio-economic household survey.

Corrective Action: A signboard was designed to highlight the availability of free seedlings to all. An intensive radio campaign was launched during planting season and large numbers of wall posters were distributed to increase awareness.

M&E Finding: Knowledge of the provisions regarding the community's ownership of forest resources in PFs and PPFs was low after two years into the project. Source: socio-economic household survey.

Corrective Action: Additional publicity materials explaining these provisions were developed and CFAs trained to use them. It was decided to encourage the organization of Forest Committees in each panchayat and among smaller user groups where necessary.

M&E Finding: Many nurseries were not meeting the private demand for the most desirable fodder species due to the cost and difficulty in seed collection. Sources: participatory evaluation, field visits, annual meetings, socio-economic household survey, monitoring reports.

Corrective Action: A separate budget line item for collection of fodder tree seeds from private farmers was established for each district. An annual calendar with a reminder of which species are to be collected and sown that month was designed and distributed to all field staff, nursery foremen, and forest committee chairmen.

M&E Finding: Most of the mortality of seedlings planted privately was due to lack of sufficient knowledge in planting techniques and seedling care. Source: private planting survey.

Corrective Action: A special extension pamphlet on planting methods was prepared and distributed to seedling takers. Graphic illustrations of these methods are included in the new distribution registers. Nursery foremen were given additional training in the importance of this subject.

M&E Finding: The most significant cause of mortality in PF plantations was the small size of seedlings at the time of plantation. Source: plantation survival survey.

Corrective Action: A nursery operation planning document was devised and training given to CFAs in its use to improve operations. A national effort has been mounted to remove the hurdles which resulted in delayed release of the budget so that operations can be started in time in the fall.

M&E Finding: Among the exotic species tried in field locations, Pinus patula shows high survival rates at between 1,500 and 2,000 meters, but the Eucalyptus, Robina, and Lucenae species tried have very low survival in most conditions where they were planted. Source: plantation survival survey.

Corrective Action: Pinus patula seeds were continued to be supplied for planting at this altitude, but the amount of seeds of the other species was curtailed and confined to certain districts.

M&E Finding: The preparation of PF and PPF management plans has been very slow. Source: monitoring reports.

Corrective Action: Targets for plan preparation have been included in the annual district work plans and budgets.

As this partial list illustrates, there has been a positive response to monitoring and evaluation from project management and policy makers. Where resistance has been encountered to the system, it has stemmed from some of the field staff who have been reluctant to file reports - as discussed earlier. In additon, while not constituting resistance to M&E itself, there have been some problems and recommendations with national level policy implications which have yet to be fully addressed by the decision-makers. Some examples of unresolved problems remaining after their detection by M&E and project management are included:

- The rate of PF and PPF handing over continues to lag significantly behind target.
- Explicit legal provisions for handing over PFs and PPFs to management groups smaller than the panchayat (such as wards and villages) have yet to be made and approved.
- Workable legal provisions and procedures for panchayats to receive their share of the proceeds from timber sales out of PPFs have yet to be established.
- The legal basis for awarding PFs to town panchayats have yet to be enacted.
- Despite considerable efforts, the problems caused by the late release of the budget and frequent transfer of staff have yet to be resolved.

## 11. CHANGES MADE IN M&E SYSTEM AND OUTSTANDING ISSUES

Although the overall system of monitoring and evaluation has remainded basically the same during its three years of operations, a number of changes continue to be made. These changes stem from three sources: changes in external conditions, changes in project implementation, and experience gained through implementing the M&E system itself. As noted in

the introduction, a good M&E system should foster the kind of project changes which in turn will require modifications to be made in the means for monitoring and evaluating the project.

At various times during the last three years, a number of changes in external conditions have necessitated modifications in monitoring data formats. These have included national level changes from a quarterly to four-monthly (trimester) budgetary system; national changes from centralized disbursement and accounting to district treasuries; Forestry Departmental territorial organization changes from Circles and Divisions to Development Regions and Districts respectively; and local political and administrative changes in the numbers and boundaries of individual panchayats. These changes have also called for revisions in the sampling frames of the on-going evaluation surveys.

Internal project changes such as those enumerated in Section 10, have also necessitated changes in reporting formats. The addition of new budgetary targets has, for example, required adding categories for reporting progress on these items. Similarly, increased emphasis on preparing management plans for PPFs has required both that the number and hectares of PPF under management be reported and that the formation and activities of local Forest Committees be monitored.

Changes based on our own experience in implementing the M&E system as well as the experience of project management have perhaps been the most important. Some surveys, such as the initial private tree ownership and use survey and the traditional stove use survey, were dropped or assimilated into other surveys once their inital exploratory function was served. The collection of some data from the CFA level such as man and woman days of employment were dropped once it was realized that they were perceived as an auditing function and thus served to discourage completion of the form for fear of accounting discrepancies. (This particular problem also led to under-reporting of female employment since daily wage rates for women are lower than for men.) However, as donor agencies and auditors pressed for more financial information, budgetary figures for field activities were added to the DFC district reporting format while limiting the number of additional reports required from him to one annual summary.

Experience with data processing and file handling also led us to a number of format changes which would make these processes more efficient and accurate. These included developing pre-coded questionnaires with data analysis variable names and numbers included in the forms; standaridizing the size of all forms to regular sized paper; and developing sets of instructions for each of the surveys to be conducted. Continued field testing also led us to change the wording and order of questions so that they would yield more reliable and valid data.

At this point in the M&E's system development, there remain a number of outstanding issues which may well require additonal changes in the future.

One of the most important of these issues concerns the question of financial monitoring. Initially, no financial monitoring was conducted aside from the accounts maintained by the CFAD accountants. However, as various consumers of monitoring information such as the World Bank and the Accountant General's Office of the Finance Ministry began to request more information on the cost of specific activities, annual budgetary information has now been included in the DFC district monitoring report. Should this be further expanded to include trimester accounts and overall project accounts? If so, is not the M&E system likely to get side-tracked into an accounting and auditing function which could also effect the willingness of field officers to cooperate with the system unless they are made directly accountable to the Chief of CFAD for their performance? And is such an integration

system, possibly by computerizing it? But can such a change in the accounting system be accomplished without the whole goverment's accounting system being changed? As these questions indicate, the issue of financial monitoring is beset by a number of questions which have so far made us reluctant to incorporate additional financial monitoring within the system.

The question of financial monitoring is closely related to the question of the linkage between this project specific M&E system and wider department, ministry, or national level monitoring and evaluation. At the moment, no such wider level system exists beyond the National Planning Commission progress reports described earlier. However, community forestry activities occur in other donor funded projects, including integrated rural development projects and soil and watershed conservation projects. At least at the Departmental level, if not higher, it would appear desiderable to have a single monitoring and on-going evaluation system that would allow results to be easily aggregated and compared. To this end, we have produced documents which spell out the community forestry project's system and data collection guidelines and formats. However, until a branch of the Forest Deparment is established to deal with this issue, it is doubtful that a generalized system will be adopted except on an ad hoc project basis.

As discussed earlier, systematic and timely receipt of monitoring information from all field officers remains a problem in the implementation of the system. In our opinion, there are only two immediate solutions to whatever remains of this problem once the transciever radio sets are installed. On the one hand, there is a need for the job descriptions of DFCs and CFAs to contain explicit reference to their responsibility for monitoring and regular reporting. This responsibility then needs to be enforced by the Office of the Chief Conservator. On the other hand, given the low salaries paid to HMG employees and the additional work entailed by project monitoring, the possibility of providing financial incentives for special monitoring reports could also be considered. Since this latter suggestions somewhat vitiates the first, however, we would be more pleased to see the first implemented along with a significant overall increase in regular salaries.

The present on-going evaluation system is high level of dependence on Volunteers and Associate Expert is a related issue which is still outstanding. To the extent that this has been a function of the CFAs initial heavy nursery construction workload and their lack of training in sampling and surveying, it should now be increasingly possible to enlist CFAs in this task. But to the extent that these specialized skills cannot be taught to all CFAs and because of the need for objective outsiders to conduct these evaluations, it may not be possible or desirable to transfer all of these tasks to the CFAs in the existing structure. For this reason, we are of the opinion that it would be useful to assign one additional CFA who has the talent and interest in each district to take full time responsibility for on-going project evaluation with additional incentives. Alternatively, a private research consulting firm with personnel trained in forestry could be awarded a contract to conduct these surveys - thereby circumventing the financial constraints which prevent the M&E Unit from hiring qualified surveyors to conduct this work. As a final possibility, a number of CFAs could be assigned to the M&E Unit, but this would require creating new positions through a process which is likely to last several years.

The transfer of the present Chief of the M&E Unit together with the completion of the FAO advisor's assignment also poses a potential question as to the sustainability and continuing development of the M&E system. To some extent this issue has been dealt with by attempting to document the working of the present system as fully as possible and train field staff in its implementation. In addition, a fellowship has been established to provide Master's degree training in the social science skills required by a young forestry officer

who would be expected to take up the work upon his return. Nonetheless it remains true that monitoring and evaluation is not considered a mainstream career activity for a forester and there is no position established or real career possibilities that would enable recruiting a social scientist for this job. Ultimately, therefore, the fate of the system will depend on the level of interest and orientation of the forestry officer assigned to this task in the future and the relative importance project management gives to M&E.

On a more theoretical level, the extent of coverage of the M&E system is also an outstanding issue. In an effort to keep the system sufficiently simple to be workable and useful, some effects and impacts have not been examined directly and systematically. To what extent should the project try and monitor what happens to forest within the panchayat which are not handed over as PPFs? To what extent should the system try and measure the change in time used for fuel collection, hand harvesting of grass, and use of improved stoves brought about by project activities? To what extent should the social factors involved in community forestry decision-making be studied and documented? We consider all of these questions, and others like them, important. While constraints of manpower and funding have precluded addressing them for the present, it may be that some of them should be taken up as special case studies in the future.

## 12. ADDITIONAL ROLES PLAYED BY THE M&E SYSTEM

A discussion of the community forestry project's monitoring and evaluation system would not be complete without noting some of the additional roles played by the implementation of the system. Just as other project components have their separate effects, the activity of monitoring and evaluation itself has had some effects beyond those specified as the system's objectives.

By having the regular project forestry staff be responsible for project monitoring at various levels, the M&E system has encouraged more attention to work planning. The requirement for CFAs to submit periodic reports on their accomplishments in each of the activity categories, is a reminder of their job responsibilities which forces them to focus on all of their assigned duties. This side effect of the system has been deliberately increased by including some monitoring questions which are intended more to ensure proper work planning than provide data for tabulation. The submission of these reports through the DFC also helps to ensure that the systematically focuses on the various work components of the project on a regular basis.

Similarly, to the extent that CFAs participate in on-going evaluation surveys they increase their extension activities. Each time a survey is conducted, more households are contacted. To explain the survey to household members, the programme must also be described to some extent. The use of random sampling techniques has the beneficial effect of ensuring that the whole spectrum of villagers become involved in this interaction and poor, out of the way households are also visited.

The collection and dissemination of the findings of monitoring and evaluation also appears to serve as a performance incentive for field staff. Preparation and submission of monitoring reports provokes a certain amount of self-evaluation which might not otherwise take place. Presentation of M&E findings are necessarily comparative, graphically pointing up districts with high achievement and survival rates review by both superiors

and peers seems to promote a degree of healthly competition and a desire to achieve reasonably good results.

Finally, at the national level, M&E information has been used to garner additional political support for the programme and answer inappropriate criticism. By documenting results, the M&E system provides answers to questions which might otherwise remain in the realm of quick impressions and opinions. For example, when doubts have been raised in the Rastriya Panchayat (national legislature) regarding the survival of plantations based on exposure to one poorly surviving plot, it has been possible for the officials to produce statistically reliable data providing a reasonable degree of survival in Nepalese mountain conditions.

While these additional roles are not the primary purpose for implementing a comprehensive, effective M&E system, they do provide positive side benefits to project implementation which should not be ignored in evaluating its usefulness.

INDICATORS FOR OUTPUTS AND DIRECT EFFECTS

| FIELD ACTIVITIES | OUTPUT INDICATORS | DIRECT EFFECTS | EFFECT INDICATORS |
|---|---|---|---|
| **NURSERY ESTABLISHMENT (TARGET - 340)** | | | |
| Division Nursery<br>(Target - 17) | # contructed<br># operational<br># seedlings produced<br># seedlings planted/ distributed | Increased employment<br>Provide water | MD/employment/sex<br># households served |
| Range Nursery<br>(Target - 51) | # constructed<br># operational<br># seedlings produced<br># seedlings planted/ distributed | | |
| Panchayat Nursery<br>(Target - 680)<br>(2 x 340 Panchayats) | # constructed<br># operational<br># seedlings planted/ distributed | | |
| **PF ESTABLISHMENT (TARGET - 11, 750 HA, 340 PANCHAYATS)** | | | |
| Selection<br>Awarded | # selected<br># awarded<br>Ha estimated area | Increased fuelwood<br>Increased leaf fodder<br>Increased grass | % survival/Ha /species<br>% survival/Ha /species<br>Kg grass cut/Ha |
| Demarcation | Km demarcated<br>Ha demarcated | Increased timber/pole<br>Increased secondary forest products | % survival/Ha /species<br>% survival/Ha /species |
| Plantation<br>Protection and maintenance | Ha planted<br>Ha maintained<br>% survived/Ha<br># PFW hired | Increased employment<br>Decreased grazing land<br>Decreased labor time | MD/employment/sex<br>Ha decreased<br>% survival/Ha /species |
| Making Plans | # plans prepared<br># plans operating | | |
| **PPF ESTABLISHMENT (TARGET - 39, 100 HA, 340 PANCHAYATS)** | | | |
| Selection<br>Awarded | # selected<br># awarded<br>Ha estimated area | Increased fuelwood<br>Increased leaf fodder<br>Increased grass | Kg collected/Ha<br>Kg collected/Ha<br>Quantity used |
| Demarcation | Km demarcated<br>Ha demarcated | Increased timber/pole<br>Increased secondary forest products | % survival/Ha /species<br>% survival/Ha /species |
| Plantation<br>Protection and maintenance | Ha planted<br>Ha maintained<br>% survived/Ha<br># PFW hired<br># plans prepared<br># plans operating | Increased employment<br>Decreased grazing land<br>Decreased labor time | MD/employment/sex<br>Ha decreased<br>% survival/Ha /species |

ANNEX I (cont'd)

OUTPUT INDICATORS (cont'd)

| FIELD ACTIVITIES | OUTPUT INDICATORS | DIRECT EFFECTS | EFFECT INDICATORS |
|---|---|---|---|
| PRIVATE PLANTING (TARGET - 900 000 SEEDLINGS) | | | |
| Distribute Seedlings | # seedlings distributed<br># persons received | Increased fuelwood<br>Increased leaf fodder | # survival/species<br># survival/species |
| Seedling Care | % surviving | Increased timber/pole<br>Increased secondary forest products | # survival/species<br># survival/species |
| STOVE IMPROVEMENT (TARGET - 15 000 STOVES) | | | |
| Distribute Models | # distributed | Decreased wood consumption | Kg decreased |
| | # in daily use | Decreased labor time | Hr./P.C./day decrease |
| Increased local adoption | # adopted | Increased stove cost | Rs. increased |
| SOIL CONSERVATION | | | |
| Plant Protection | # areas protected | Decreased erosion | # areas stabilized |
| Infrastructure Protection | # areas protected | | |
| LOCAL TRAINING | | | |
| PFF and PFW Training | # PFF trained<br># PFW trained | Increased effectiveness<br>Increased demand | % survival increased<br>% awareness increased |
| MOTIVATION AND EDUCATION | | | |
| Seminars/Workshop | # held<br># persons involved | Increased knowledge<br>Increased effectiveness | Amount increased<br>Demand increased |
| Distribution Materials | # materials distributed | | % awareness increased |
| Extension Sessions | # sessions held<br># males involved | | % survival higher |
| Signboard Established | # in place | | |
| Study Tours | # study tours<br># persons involved | | |
| Schools Involved | # schools involved | | |
| Radio Programmes | # programmes aired | | |

ANNEX I (cont'd)

## INDIRECT EFFECTS AND INDICATORS

| Overall Indirect Effects | Possible Indicators |
|---|---|
| Increased community management or forest land resources | - Hectares managed by Panchayat through operational working plans |
| | - Man days of labor contributed by community to FDP activities |
| | - Number of PPF watchers to local community |
| | - Distribution of costs to various segments of community |
| Change in local forest product harvesting pattern | - Number of management plans being implemented |
| Change in livestock grazing and feeding patterns | - Percentage feed from stall feeding |
| | - Annual number of grazing days per livestock changed |
| | - Usable Kgs manure per capita changed |
| Change in use of fire in hazardous forest areas | - Hectares burned per year |
| Increase in panchayat income from forestry | - Rupees per year increased |
| Increased soil and water conservation | - Hectares with increased ground and crown cover |
| | - Number of gulleys protected |
| | - Hectares of decreased grazing |
| Farm member time allocation changed | - Hours per capita per day spend on fuelwood, fodder, and timber collection changed |

ANNEX 1 (cont'd)

## IMPACTS AND INDICATORS

| Long Term Impacts | Possible Indicators |
|---|---|
| Self-sustaining ecologically sound man-forest relationships established | - Natural resource exploitation in balance with regeneration |
| Increased agricultural productivity | - Increased yield per hectare through increased manure per hectare |
| Increased livestock productivity | - Increased income from livestock products |

## INPUTS INDICATORS

| Inputs and Activities | Indicators |
|---|---|
| Forestry staff: CFAD and Forest Divisions | - Positions filled by category<br>- Performance |
| Funds (budget) | - Money allocated and spent by quarter |
| Technical Assistance | - Position filled<br>- Performance |
| Buildings and land purchase | - Unit by category |
| Vehicles | - Functional units by category |
| Radio Equipment | - Functional units by category |
| Provenance Trials | - Number of plots |
| Office Equipment and Supplies | - Budget expended |

ANNEX 11

DISTRICT: FISCAL YEAR

## DFC ANNUAL REPORT FOR CFDP MONITORING
### PART I - SUPPORTING ACTIVITIES

DFC: DATE:

| CFDP Budget Only Budget Head | Annual Allocation Rs. | Amount Released Rs. | Actual* Expenditure Rs. | Amount Advanced Rs. | Remarks |
|---|---|---|---|---|---|
| (1) Salary | | | | | |
| (2) Allowances | | | | | |
| (3) TA/DA | | | | | |
| (4) 4.1 Services & Utilities | | | | | |
| 4.2 Other Services | | | | | |
| (5) Rent | | | | | |
| (6) Maintenance | | | | | |
| (7) 7.1 Office Goods | | | | | |
| 7.2 Journals | | | | | |
| 7.3.1 Vehicle Fuel | | | | | |
| 7.3.2 Other Fuel | | | | | |
| 7.5 Other Goods | | | | | |
| (10) 10.1 Furniture | | | | | |
| 10.3 Machine & Equip. | | | | | |
| (11) 11.1 Land Purchase | | | | | |
| PART I SUBTOTAL | | | | | |

* Actual expenditure should not include outstanding amount advanced.

| Names of CFAs in Post | Date Joining District | Permanent or Temporary | No. of Panchayats Covered | No. of MFTW Courses Attended |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |

ANNEX II (Cont'd)

PART II - FIELD ACTIVITIES

| CFDP Budget only Budget Head | Annual Targe | Annual Progress | Annual Allocation Rs. | Amount Released Rs. | Actual* Expenditure Rs. | Amount Advanced Rs. |
|---|---|---|---|---|---|---|
| (Rs.) | | | | | | |
| (8) Donation & Contribution: | | | | | | |
| (a) PFF & PFW Wages | | | | | | |
| (b) Nursery & Plant tools | | | | | | |
| (9) Miscellaneous: (No.) | | | | | | |
| (a) Training nursery foremen and watchers | | | | | | |
| (b) District Seminar | | | | | | |
| (c) Regional Seminar | | | | | | |
| (d) Group Study Tour | | | | | | |
| (e) Others (Arbor Day, etc.) | | | | | | |
| (12) Construction & Imp. (No.) | | | | | | |
| (12.1) Building Constr: | | | | | | |
| (a) DFC Office | | | | | | |
| (b) DFC Quarter | | | | | | |
| (c) Guest House | | | | | | |
| (d) Range Office | | | | | | |
| (e) Range Quarter | | | | | | |
| (f) Other Improvement | | | | | | |
| (12.2) Other Constr. (No.) | | | | | | |
| (a) Nursery Constr: | | | | | | |
| i) District Nursery | | | | | | |
| ii) Range Nursery | | | | | | |
| iii) Panchayat Nursery | | | | | | |
| (b) Seed Procurement (Rs) | | | | | | |
| (c) Nursery Operation (No.) | | | | | | |
| i) District Nursery | | | | | | |
| ii) Range Nursery | | | | | | |
| iii) Panchayat Nursery | | | | | | |

* Actual expenditure should not include outstanding amount advanced

ANNEX II (Cont.)

PART II - FIELD ACTIVITIES

| CFDP Budget Head (12.2) continued | Annual Target | Annual Progress | Annual Allocation Rs. | Amount Released Rs. | Actual* Expenditure Rs. | Amount Advanced Rs. |
|---|---|---|---|---|---|---|
| (d) Demarcation (Km.) i) PF demarcation | | | | | | |
| ii) PPF demarcation | | | | | | |
| (e) Planting (ha.) i) PF planting | | | | | | |
| ii) PPF planting | | | | | | |
| (f) Replacement planting (No. of Plants) | | | | | | |
| (g) Weeding (ha.) | | | | | | |
| (h) Fire protection (ha.) | | | | | | |
| (i) Fencing (meters) | | | | | | |
| (j) Management Plan Preparation (No.) i) PF | | | | | | |
| ii) PPF | | | | | | |
| (k) Trial Plots (No.) | | | | | | |
| (l) Stoves Distributed (No.) | | | | | | |
| (m) Other (Specify): | | | | | | |
| PART II SUB TOTAL | | | | | | |
| TOTAL CFDP FIELD BUDGET (PART I + PART II) | | | | | | |

* Actual expenditure should not include outstanding amount advanced.

ANNEX II (Cont.)

PART III - ADDITIONAL INFORMATION ON FIELD ACTIVITIES

| | | Target | Achievement |
|---|---|---|---|
| 1. | Total number of seedlings produced in district(s) in the year: | | |
| 2. | Total number of seedlings distributed for private planting in the year: | | |
| 3. | Total number of households/institutions receiving free seedling in year: | | |
| 4. | Total number of PF handed over in year: | | |
| 5. | Total number of PPF handed over in year: | | |
| 6. | Total hectare of PF handed over in year: | | |
| 7. | Total hectare of PPF handed over in year: | | |
| 8. | Total number of PF watchers employed: | | |
| 9. | Total number of nursery naike trained in year: | | |
| 10. | Total number of PF watchers trained in year: | | |
| 11. | Total number of Pradhan Panchas participating in study tour in year: | | |
| 12. | Total number Forest Committees established in District(s): | | |
| 13. | Total hectares covered by PF management plans: | | |
| 14. | Total hectares covered by PPF management plans: | | |

15. Names of Panchayats participating in programme during year:

Since 1979 - 80:

Since 1980 - 81:

Since 1981 - 82:

Since 1982 - 83:

Since 1983 - 84:

Since 1984 - 85:

Since 1985 - 86:

16. Major Problems, Successes, Comments (add additional pages if desired):

ANNEX II (Cont.)

DISTRICT:

FISCAL YEAR:
TRIMESTER: 1/2
(Circle)

CFA/RANGER FIRST/SECOND TRIMESTER MONITORING REPORT

CFA/RANGER:

DATE:

I. Nursery Report (Including District and Range Nurseries)

| Name of Nursery | 1. | 2. | 3. | 4. | 5. |
|---|---|---|---|---|---|
| Date new nursery construction complete | | | | | |
| Date operation plan complete | | | | | |
| Total seedlings required this year | | | | | |
| Usable seedlings in stock from last year | | | | | |
| Total seedlings in stock for this year | | | | | |

II. Panchayat Report (Including participating panchayats without nurseries)

| Name of Panchayat | 1. | 2. | 3. | 4. | 5. |
|---|---|---|---|---|---|
| Ha. PF selected for planting | | | | | |
| Ha. PPF selected for planting | | | | | |
| Seedlings required for pvt. planting | | | | | |
| Ha. weeding conducted (PF & PPF) | | | | | |
| Km. demarcated (PF & PPF) | | | | | |
| Ha. PF handed over | | | | | |
| Ha. PPF handed over | | | | | |
| No. PF management plans prepared | | | | | |
| No. PPF management plans prepared | | | | | |
| No. Forest Committee Meetings Held | | | | | |
| No. Stoves Distributed | | | | | |

Other Activities Conducted (e.g. extension activities, voluntary participation by panchayat, etc.):

Major Problems and Comments (continue on back side if needed):

ANNEX II (Cont.)

DISTRICT: FISCAL YEAR:

CFA/RANGER ANNUAL MONITORING REPORT

CFA/RANGER:

I. Nursery Report (Including District and Range Nurseries)

| Name of Nursery | 1. | 2. | 3. | 4. | 5. |
|---|---|---|---|---|---|
| No. Total seedlings produced: | | | | | |
| No. Usable seedlings in stock for next yr. | | | | | |
| No. Private Planting seedlings distributed: | | | | | |
| No. Households/Institutions distributed to: | | | | | |
| Operation plan made (yes or no) for next yr. | | | | | |
| Signboard established (yes or no) | | | | | |
| Nursery naike trained (yes or no) | | | | | |
| Nursery Register (yes or no) | | | | | |
| Distribution Register (yes or no) | | | | | |

II. Panchayat Report (Including participating panchayats without nurseries)

| Name of Panchayat | 1. | 2. | 3. | 4. | 5. |
|---|---|---|---|---|---|
| 1. Panchayat Forest - This year | | | | | |
| Ha. PF planted this year | | | | | |
| No. PF handed over this year | | | | | |
| Ha. PF handed over this year | | | | | |
| No. PF management plans this year | | | | | |
| Km PF demarcated this year | | | | | |
| Plantation Register (yes or no) | | | | | |
| 2. Panchayat Protected Forest-This year | | | | | |
| Ha PPF planted this year | | | | | |
| No. PPF handed over this year | | | | | |
| Ha. PPF handed over this year | | | | | |
| No. PPF management plans this year | | | | | |
| Km PPF demarcated this year | | | | | |
| Ha. Enrichment planting this year | | | | | |

ANNEX II (Cont.)

| Name of Panchayat | 1. | 2. | 3. | 4. | 5. |
|---|---|---|---|---|---|
| 3. PF & PPF Combined - This year<br>No. plants replaced this year | | | | | |
| Ha. Weeding this year | | | | | |
| Total No. PFW working this year | | | | | |
| Total No. of PFW trained this year | | | | | |
| Ha. fire protection this year | | | | | |
| Meters fenced this year | | | | | |
| Total members in Forest Committee | | | | | |
| 4. Panchayat Forest - All Years<br>Ha. PF planted all years | | | | | |
| No. PF applied for all years | | | | | |
| No. PF handed over all years | | | | | |
| Ha. PF handed over all years | | | | | |
| No. PF management plans | | | | | |
| Ha. under PF management plans | | | | | |
| Km. PF demarcated all years | | | | | |
| 5. PPF - All Years<br>Ha. PPF planted all years | | | | | |
| No. PPF applied for all years | | | | | |
| No. PPF handed over all years | | | | | |
| Ha. PPF handed over all years | | | | | |
| No. PPF management plans | | | | | |
| Ha. under PPF management plans | | | | | |
| Km. PPF demarcated all years | | | | | |
| 6. Stoves<br>No. distributed this year: | | | | | |
| No. distributed all years: | | | | | |

ANNEX II (Cont.)

Major Species Raised with Seed Source:

| Species | Seed Source |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |

| Species | Seed Source |
|---|---|
| 6. | |
| 7. | |
| 8. | |
| 9. | |
| 10. | |

Major Problems and Comments:

ANNEX II (Cont.)

CFAD - MEU

VOLUNTEERS/ASSOCIATE EXPERTS MONTHLY REPORT

DISTRICT(S): DATE: A/E VOLUNTEER:

PART 1: GENERAL DISTRICT REPORT

1) ACTIVITIES THIS MONTH:

2) SILVICULTURAL ISSUES (e.g. seed collection, technical problems, species success, techniques introduced, overall (success, etc.)

3) SOCIO-ECONOMIC ISSUES (e.g. land availability, people's motivation local leadership, success of programme, problems encountered, etc.)

ANNEX II (Cont.)

SELECTED PANCHAYATS (Semi-annually or when known; note District)

| 1983/84 | 1984/5 | 1985/6 |
|---|---|---|
| 1. ..... | 1. ..... | 1. ..... |
| 2. ..... | 2. ..... | 2. ..... |
| 3. ..... | 3. ..... | 3. ..... |
| 4. ..... | 4. ..... | 4. ..... |
| 5. ..... | 5. ..... | 5. ..... |

4) TRAINING AND EXTENSION (e.g. courses held, adequacy of materials, problems and successes, etc.)

5) ADMINISTRATION AND LOGISTICS (e.g. positions unfilled, budget adequacy, supplies and equipment needed, etc.)

6) STOVE IMPROVEMENT (e.g. models received, surveys conducted, acceptance, local reactions, etc.)

7) TRIAL PLANTING (e.g. activities and results, etc.)

8) RECOMMENDATIONS, SUGGESTED CHANGES, REQUESTS, OTHER MATTERS:

ANNEX III

## PLANTATION SURVIVAL REPORTING FORM

| | | No. | Name | Code/Value |
|---|---|---|---|---|
| 1. | Name of PF:_____ | 1. | ID# | ⌊_⌊_⌊_⌋ + |
| 2. | District:_____ | 2. | DIST | ⌊_⌊_⌋ * |
| 3. | Panchayat:_____ | 3. | PAN | ⌊_⌊_⌊_⌋ + |
| | Village/PF:_____ | | | |
| | Surveyor:_____ | | | |
| | Date:_____ | | | |
| 4. | Year Planted:_____ | 4. | YEAR | ⌊_⌊_⌋ |
| 5. | Hectares Planted:_____ | 5. | HA | ⌊_⌊_⌊_⌋ |
| 6. | Total Seedlings planted:_____ | 6. | SDPL | ⌊_⌊_⌊_⌊_⌊_⌊_⌋ |
| 7. | Total Replacement No.:_____ | 7. | SDRP | ⌊_⌊_⌊_⌊_⌊_⌋ |
| 8. | Main Replacement Year:_____ | 8. | RPYR | ⌊_⌊_⌋ |
| 9. | Average Altitude (m):_____ | 9. | ALT | ⌊_⌊_⌊_⌋ |
| 10. | Main Aspect: (1) N, (2) NE, (3) E, (4) SE (5) S, (6) SW, (7) W, (8) NW | 10. | ASP | ⌊_⌋ |
| 11. | Dominant Vegetation Before Planting | 11. | VEG | ⌊_⌋ |

(1) Open grasslands (2) Small bushes (non-tree)
(3) Small tree bushes
(4) Scattered broad leaf trees
(5) Scattered conifers (6) Other

| | | | | |
|---|---|---|---|---|
| 12. | Natural Regemeration: | 12. | NREG | ⌊_⌋ |

(1) Very good (more than 1,500 stems/ha.)
(2) Good (500 - 1,500 stems/ha.)
(3) Some (100 - 500 stems/ha.)
(4) Very little (less than 100 stems/ha.)
(5) None

| | | | | |
|---|---|---|---|---|
| 13. | Any Product Collected from PF last year? | 13. | PROD | ⌊_⌋ |

(1) Yes (2) No

| Type of Product | Collected Last Year? (Tick if yes) | Collected by Local People or Auction/ Contract? | Rupees obtained (if any) |
|---|---|---|---|
| Grass/Fooder<br>Fuelwood<br>Poles/Timber<br>Fruit<br>Other: | | | |

+ Leave blank - to be coded later
* From code sheet

**ANNEX III (Cont.)**

RESULTS OF SURVIVAL COUNT

| Species | Total No. Planted | Total No. Surviving | % Survival | Est. Ave. Height (nearest meter) | Est. Ave. DBH (nearest cm) | Reasons for lack of Survival (see codes) |
|---|---|---|---|---|---|---|
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| TOTAL/AVE | | | | | | |

| | | | |
|---|---|---|---|
| 14. | Total No. of species Planted: | 14. | SP # ☐☐ |
| 15. | Total No. seedlings Planted: | 15. | PL # ☐☐☐☐☐☐ |
| 16. | Total No. Surviving: | 16. | SUR # ☐☐☐☐☐☐ |
| 17. | Total Surviving Percentage | 17. | SUR% ☐☐ |
| 18. | Estimated average height for main species: | 18. | HTH ☐☐ |
| 19. | Estimated average dbh for main species: | 19. | DBH ☐☐ |
| 20. | Main Reason for Lack of Survival: | 20. | $MOR_1$ ☐ |
| 21. | Second Reason Lack of Survival: | 21. | $MOR_2$ ☐ |
| 22. | Third Reason Lack of Survival: | 22. | $MOR_3$ ☐ |

Comments and Remarks:

WORK SHEET FOR COUNTING SURVIVAL

| Contour Traverse No. | Surviving Seedling Counted by Species | | | | | | | | Total Surviving | Empty (Not Surviving) | Total Counted |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Species: | Species: | Species: | Species: | Species: | Species: | Species: | Species: | | | |
| 1. | | | | | | | | | | | |
| 2. | | | | | | | | | | | |
| 3. | | | | | | | | | | | |
| 4. | | | | | | | | | | | |
| Sub Total | | | | | | | | | | | |
| Est. Ave. Ht. | | | | | | | | | | | |
| Est. Ave. dbh | | | | | | | | | | | |

ANNEX III (Cont.)

## PRIVATE PLANTING SURVEY

01 ID ⌊_⌊_⌊_⌋

1. Year of distribution being sampled: 198..... Surveyor:.....
   (see No. 25 next page) Date: .....

| | | V # | Name | Value |
|---|---|---|---|---|
| 2. | District (DFC Headquarters) ..... | 02 | FDHQ | ⌊_⌊_⌋ |
| 3. | District of Survey ..... | 03 | DIST | ⌊_⌊_⌋ |
| | Panchayat ..... | | | |
| | Ward Number ..... Village Name ..... | | | |
| 4. | Household Head Name or Institution Name ..... | | | |
| | ..... | | | |
| | Code (0) for household, (1) for Institution . | 04 | INST | ⌊_⌋ |
| 5. | Estimated Altitude: (1) 1-1000m (2) 1000-2000 (3) 2000-3000m, (4) above 3000m ..... | 05 | ALT | ⌊_⌋ |
| 6. | Number of cattle and buffalo ..... | 06 | LLIV | ⌊_⌊_⌊_⌋ |
| 7. | Number of sheep and goats ..... | 07 | SLIV | ⌊_⌊_⌊_⌊_⌋ |
| 8. | Number of household members ..... | 08 | HHP | ⌊_⌊_⌋ |
| 9. | Ethnic group/caste ..... | 09 | ETH | ⌊_⌊_⌋ |
| 10. | Amount of Khet .. Unit: Ropani .. or Bigha . | 10 | KHET | ⌊_⌊_⌋ ⌊_⌊_⌋ |
| 11. | Amount of Bari .. Unit: Ropani .. or Bigha . | 11 | BARI | ⌊_⌊_⌋ ⌊_⌊_⌋ |
| 12. | Number of seedlings taken before sample yr... | 12 | BSED | ⌊_⌊_⌊_⌊_⌋ |
| 13. | Number of seedlings taken in sample year .... | 13 | SSED | ⌊_⌊_⌊_⌊_⌋ |
| 14. | Number of seedlings taken after sample year . | 14 | ASED | ⌊_⌊_⌊_⌊_⌋ |
| 15. | Distance from Nursery in hours and % of hr... | 15 | DIST | ⌊_⌊_⌋ ⌊_⌊_⌋ |
| | (Note one day = 8 hours) | | | |

| Name of Species | Number Planted | Estimated Number Surviving | Where planted (1) house (2) bari (3) khar/bari (4) other | Est. Ave. Ht. (nearest meter) | Est. Ave. dbh (nearest cm) | Main Reasons* for Mortality | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 1st | 2nd | 3rd |
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| TOTAL | | | | | | | | |

Average % Survival _____ For main species

* From code sheet + Leave blank - to be coded later

ANNEX III (Cont.)

| | | | |
|---|---|---|---|
| 16. | Total planted seedlings surviving for yr. counted.. | 16 | SUR ⌊_⌊_⌊_⌊_⌋ |
| 17. | Average survival Percentage ..... | 17 | SUR% ⌊_⌊_⌊_⌋ |
| 18. | Who brought most of the seedlings? (1) Adult male (2) Adult female (3) Child (4) Non-household member ..... | 18 | BRGT ⌊_⌋ |
| 19. | Estimated average height for main species .....m | 18 | HTH ⌊_⌊_⌋ |
| 20. | Estimated average dbh for main species .....cm | 19 | DBH ⌊_⌊_⌋ |
| 21. | Method of seedling transport ..... (1) with poly pot container (2) bare root | 21 | METH ⌊_⌋ |
| 22. | Number of times weeded after planting ..... | 22 | WEED ⌊_⌋ |
| 23. | Main reason for failures ..... | 21 | FAIL ⌊_⌊_⌋ |
| 24. | Number desired in 1983 ..... (If not known, code 99) | 22 | SED3 ⌊_⌊_⌊_⌊_⌋ |
| 25. | Year of distribution being sampled: 198... ..... | 23 | YEAR ⌊_⌊_⌋ |
| 26. | Did they obtain the number and species they wanted? (1) Yes, both number and species (2) yes, for number, no for species (3) no, for number, yes for species (4) no, neither number nor species (5) don't know | 26 | SPEC ⌊_⌋ |
| 27. | How did they first hear about seedlings being available? (1) CFA, DFC (2) Naike-PFF (3) Heralu-PFW (4) Village leader (5) Observation - lives near nursery (6) Radio (7) Extension material (8) Meeting (9) School teacher (10) Other I don't know | 27 | HEAR ⌊_⌊_⌋ |
| 28. | Type of Sampling Used (1) Simplified (2) Probability (3) Other | 28 | SAMP ⌊_⌋ |

COMMENTS/REMARKS:

ANNEX III (Cont;)

IMPROVED STOVE USE SURVEY

| | | V# | Name | Value/Code |
|---|---|---|---|---|
| 1. | Household name ..... Ward No.: ..... | 01 | HH # | ⌊⌋⌊⌋⌊⌋⌊⌋+ |
| | Village name ..... | | | |
| | HOUSEHOLD CHARACTERISTICS: | | | |
| 2. | District: ..... | 02 | DIST | ⌊⌋⌊⌋* |
| 3. | Panchayat: ..... | 03 | PAN | ⌊⌋⌊⌋⌊⌋+ |
| | Village: ..... | | | |
| | Surveyor: ..... | | | |
| | Date (Roman): ...../..... 1983 | | | |
| | Main Cook's name: ..... | | | |
| 4. | New stove type: (1) Insert (2) Double wall (3) Modified Magan Chulo (4) Other ..... | 04 | NSTO | ⌊⌋ |
| 5. | Months installed: ..... | 05 | AGE | ⌊⌋⌊⌋ |
| 6. | Floor installed: (1) Ground (2) 1st Floor (3) 2nd Floor (4) 3rd Floor | 06 | FLOR | ⌊⌋ |
| 7. | Installer ..... # ..... | 07 | INST | ⌊⌋⌊⌋+ |
| 8. | Ethnic/group/caste (see code): ..... | 08 | ETH | ⌊⌋⌊⌋* |
| 9. | Regular number of household members: ..... | 09 | HPOP | ⌊⌋⌊⌋ |
| 10. | Number children less than 10 years old: ..... | 10 | CPOP | ⌊⌋⌊⌋ |
| | STOVE USE: | | | |
| 11. | Present use of improved stove: (0) Used at present (1) not used ..... | 11 | STOU | ⌊⌋ |
| 12. | (If not used at present) Number of months previously used: ..... | 12 | MUSE | |
| 13. | (If not used at present) why is stove not being used) ..... | | | |
| | ..... Skip to Question No. 25 ..... | 13 | NOTU | ⌊⌋+ |
| 14-18 | Number of times improved stove used for the following purposes in last week: | | | |
| | 14. Main meals per week ..... | 14 | MEAL | ⌊⌋⌊⌋ |

+ Leave blank - to be coded later
* From code sheet

ANNEX III (Cont.)

| | | V# | Name | Value/Code |
|---|---|---|---|---|
| 15. | Snacks and tea per week ..... | 15 | STEA | |
| 16. | Livestock feed per week ..... | 16 | FEED | ⌊_⌋⌊_⌋ |
| 17. | Room heating ..... | 17 | HEAT | ⌊_⌋⌊_⌋ |
| 18. | Other (specify)[1] ..... | 18 | OTH | ⌊_⌋⌊_⌋ |
| 19. | Type of traditional stove previously used by household: (1) mud stove (2) tripod 3 stones (3) both (4) other ..... | 19 | TYPE | ⌊_⌋ |
| 20-24 | Number of times traditional stove used for the following purposes last week:[2] | | | |
| 20. | Main meals per week ..... | 20 | TMEA | ⌊_⌋⌊_⌋ |
| 21. | Snacks and tea per week ..... | 21 | TSTE | ⌊_⌋⌊_⌋ |
| 22. | Livestock feed per week ..... | 22 | TFEE | ⌊_⌋⌊_⌋ |
| 23. | Room heating ..... | 23 | THEA | |
| 24. | Other (specify)[1] ..... | 24 | TOTH | |
| | CONDITION OF IMPROVED STOVE | | | |
| 25. | Firebox: (0) not cracked (1) cracked (2) broken. | 25 | FIRE | ⌊_⌋ |
| 26. | Front Arch: (0) not cracked (1) cracked (2)broken. | 26 | ARCH | ⌊_⌋ |
| 27. | Baffle: (0) not cracked (1) cracked (2) broken .... | 27 | BAF | ⌊_⌋ |
| 28. | Chimney: (0) not cracked (1) cracked (2) broken .. | 28 | CHIM | ⌊_⌋ |
| 29. | Repaired: (0) not required (1) not repaired (2) partially (3) completely ..... | 29 | REP | ⌊_⌋ |
| 30. | Inside Chimney: (0) clean (1) soot accumulated (2) Ash accumulated (3) both ash and soot accumulated ..... | 30 | ASHC | ⌊_⌋ |
| 31 | Is there ash in firebox or back connecting pipe (0) no (1) yes ..... | 31 | ASHP | ⌊_⌋ |
| 32. | Number of times chimney cleaned by installer ..... | 32 | CLNI | ⌊_⌋ |
| 33. | Number of times chimney cleaned by household ..... | 33. | CLNH | ⌊_⌋ |
| | STOVE INSTALLATION | | | |
| 34. | Measurements: (0) Within tolerance limits (1) Slightly exceeds limits (2) Greatly exceeds limits ..... | 34 | MEAS | ⌊_⌋ |

1/ For example: wine/alchohol, drying of meat, cardamon, fish, etc.

2/ If all traditional stoves removed, use code (-9); if present but not used, code (00).

ANNEX III (Cont.)

| | | V# | Name | Value/Code |
|---|---|---|---|---|
| 35. | Chimney installation: (0) Good (1) Minor problems (2) major problems (note separately).... | 35 | CHIM | ⌊_⌋ |
| 36. | Stove and chimney location: (0) Good (1) Bad.... | 36 | LOCA | ⌊_⌋ |
| 37. | Frequently used pots fit holes: (0) Good (1) Fair (2) Poor ..... | 37 | PFIT | ⌊_⌋ |
| 38. | Has user modified stove? (0) No (1) Yes - if yes describe under comments ..... | 38 | MOD | ⌊_⌋ |
| | FUEL USE PER WEEK (in kg.) | | | |
| 39. | Estimated percentage fuelwood saving: ..... | 39 | FUEL | |
| 40. | Amount of fuelwood used before improved stove per week ..... | 40 | FUB | |
| 41. | Amount of fuelwood used at present per week ..... | 41 | FUP | |
| 42. | Present price of fuelwood per kg: ..... | 42 | FURS | ⌊_⌋⌊_⌋ |
| 43. | Average amount purchased before improved stove per week ..... | 43 | FUPR | ⌊_⌋⌊_⌋ |
| 44. | Average amount purchased at present per week ..... | 44 | FUPA | ⌊_⌋⌊_⌋ |
| 45. | Straw/Agricultural residue used before per week .. | 45 | AGRB | |
| 46. | Straw/Agricultural residue used at present/week .. | 46 | AGRP | |
| 47. | Dung burnt before per week ..... | 47 | DUB | |
| 48. | Dung burnt at present per week ..... | 48 | DUP | ⌊_⌋ |
| | USER'S ATTITUDES | | | |
| 49. | Meal cooking time: (0) Decreased (1) same (2) increased ..... | 49 | TIME | ⌊_⌋ |
| 50. | Comparative convenience: (0) better (1) same or mixed (2) worse ..... | 50 | CONV | ⌊_⌋ |
| 51. | Reduction in smoke: (0) like (1) mixed opinion (2) dislike ..... | 51 | SMOK | ⌊_⌋ |
| 52. | Heat in second pot hole: (0) sufficient (1) not sufficient ..... | 52 | $POT_2$ | ⌊_⌋ |
| 53. | Size of wood inlet: (0) O.K. (1) too small (2) too big ..... | 53 | SIZE | ⌊_⌋ |
| 54. | How did you know about the new stove: (1) Neighbours (2) Promoter/Installer (3) Village leader (4) Saw demonstration model (5) Extension booklet (6) Poster (7) Other extension agent (9) Other (specify): ..... | 54 | KNOW | ⌊_⌋ |

ANNEX III (Cont.)

| | V# | Name | Value/Code |
|---|---|---|---|
| 55. Would you be willing to purchase replacement part of stove? (0) Yes (1) Yes if cheap (2) No (3) Don't know ..... | 55 | PURC | ⌊_⌋ |
| 56. Number of visits by promoter since installation | 56 | VIST | ⌊_⌋ |
| 57. Estimated economic status of household (1) High (2) Average (3) Low ..... | 57 | ECON | ⌊_⌋ |

COMMENTS/REMARKS:

- If improved stove is not being frequently used for some purposes, Why not?

- What suggestions for improving the stove design or installation does the respondent have?

- Other Comments:

ANNEX IV

## COMMUNITY FORESTRY DEVELOPMENT

## PRELIMINARY FIELD ACTIVITIES OUTPUT SUMMARY UP TO MID-JULY 1983 1/

| Field Activities | Unit | 5 year target | Target to date | Achieved to date | 82-83 target % achieved | % achieved to date |
|---|---|---|---|---|---|---|
| Panchayat Nurseries | No. | 340 | 316 | 300 | 95 | 95 |
| Village Nurseries | No. | 51 | 34 | 33 | 97 | 97 |
| Division Nurseries | No. | 17 | 17 | 17 | 100 | 100 |
| PF Planted | Ha. | 11 750 | 3 200 | 3 709 | 94 | 116 |
| PPF Planted | Ha. | 3 910 | 2 269 | 336 | 22 | 15 |
| Total Plantation | Ha. | 15 660 | 5 469 | 4 045 | 70 | 74 |
| Seedling Distribution | No. | 900 000 | 359 000 | 1 075 500 | 208 | 300 |
| Demarcation | Km. | 4 500 | 2 825 | 1 437 | 60 | 51 |
| PFF,PFW Training Course 2/ | No. | 85 | 52 | 36 | 72 | 69 |
| Stove Distribution | No. | 15 000 | 2 775 | 2 630 | 100 | 95 |
| Seminars/ Workshops 3/ | No. | 60 | 59 | 22 | 62 | 37 |

## PRELIMINARY SUPPORTING ACTIVITIES OUT-PUT SUMMARY UP TO MID-JUNE 1983

| Supporting Activities | Unit | 5 year target | Target to date | Achieved to date | 82-83 target % achieved | % achieved to date |
|---|---|---|---|---|---|---|
| Building Construction | No. | 131 | 131 | 47+(16) half | 66 | 42 |
| Radio Communication | Station | 17 | 17 | — | — | — 4/ |
| Vehicle Purchase | No. | 12 | 12 | 11. | 100 | 92 |

1/ Includes additional district of Jajarkot, Dailekh Forest Division.

2/ PFF and PFW training target fixed at one per year in each Division.

3/ National, Regional and District Seminars and publicity materials as required.

4/ Equipment arrived in April 1984, awaiting installation.

ANNEX IV (Cont.)

## 1981 & 1982 PLANTATION SURVIVAL RATES BY DIVISION

| Division | No. of Plantations Counted | Total Hectare | Average Hectare | Survival % by Seedlings | Surv. % by Plant. | Average Seed Per Ha |
|---|---|---|---|---|---|---|
| ILAM | 28 | 155 | 5.53 | 51.18 | 53.50 | 1798 |
| KANCHAAJANGA (Panchtar & Taplejung) | 6 | 28 | 4.66 | 69.74 | 68.20 | 1652 |
| TAMAKOSHI* (Ramechhap) | 12 | 69 | 5.78 | 78.79 | 69.40 | 1775 |
| TRISHULI (Dhading) | 6 | 35 | 5.83 | 74.00 | 78.20 | 1697 |
| GROKHA (Tanabu) | 17 | 117 | 6.88 | 48.76 | 48.20 | 1478 |
| POKHARA (Kaski & Syangja) | 1 | 6 | 6.00 | 38.00 | 38.00 | 1667 |
| DHAULAGIRI (Balglung & Parbat) | 13 | 50 | 3.84 | 74.25 | 74.10 | 1845 |
| ACHAM (Achham & Bajura) | 15 | 34 | 2.26 | 55.32 | 56.80 | 1745 |
| DOTI (Doti & Bajhang) | 11 | 36 | 3.27 | 59.49 | 64.20 | 1639 |
| DANDELDHURA | 5 | 30 | 6.09 | 62.90 | 64.20 | 1639 |
| MAHAKALI | 20 | 170 | 8.50 | 80.18 | 64.20 | 1639 |
| TOTAL/AVE. BY COUNT (1981 & 1982) | 130 | 731 | 5.45 | 64.69 | 61.00 | 1712 |
| 1981 Results** | 37 | 197 | 5.32 | 59.92 | 58.62 | 1715 |
| 1982 Results** | 97 | 534 | 5,50 | 66,41 | 61,80 | 1711 |

* If the two experimental direct seeding plantations are eliminated from this analysis, Tamakoshi's rates would be 84.76% and 85.76% respectively.

** See Annex 1 and 2 for details

ANNEX IV (Cont'd)

## COMMUNITY FORESTRY DEVELOPMENT

### KNOWLEDGE ABOUT COMMUNITY FORESTRY

(in percentage)

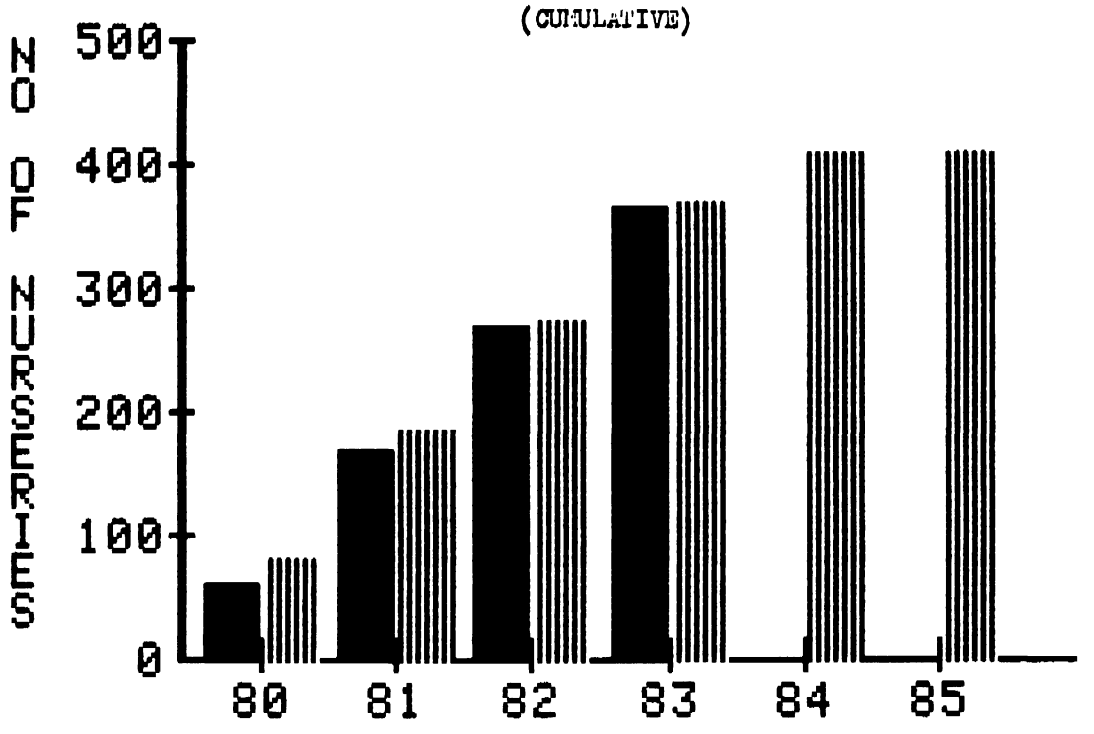
| | | | 79/80 "Old" Panchayats | 81/82 "New" Panchayats | Control* Panchayats |
|---|---|---|---|---|---|
| 1. | Seen Nursery | - Household | 59 | 29 | 19 |
| | | - Ward Leaders | 83 | 73 | 32 |
| 2. | Free Seedling Knowledge | - Household | 43 | 19 | 19 |
| | | - Ward Leaders | 79 | 62 | 26 |
| 3. | Seen Forest Plantation | - Household | 48 | 18 | 20 |
| | | - Ward Leaders | 77 | 39 | 36 |
| 4. | FF Ownership Knowledge | - Household | 32 | 22 | 27 |
| | | - Ward Leaders | 63 | 52 | 37 |
| 5. | Possibility of PFs | - Household | 62 | 60 | 50 |
| | | - Ward Leaders | 86 | 74 | 72 |
| 6. | PPF Rules Knowledge | - Household | 0 | 4 | 0 |
| | | - Ward Leasers | 12 | 5 | 3 |
| 7. | Met DFO | - Ward Leaders | 42 | 35 | -- |
| 8. | Met CFA | - Ward Leaders | 57 | 40 | -- |

* Control panchayats are made up of randomly selected non-participating panchayats surveyed for comparison purposes.

ANNEX V

## OPERATIONAL NURSERIES

(CUMULATIVE)

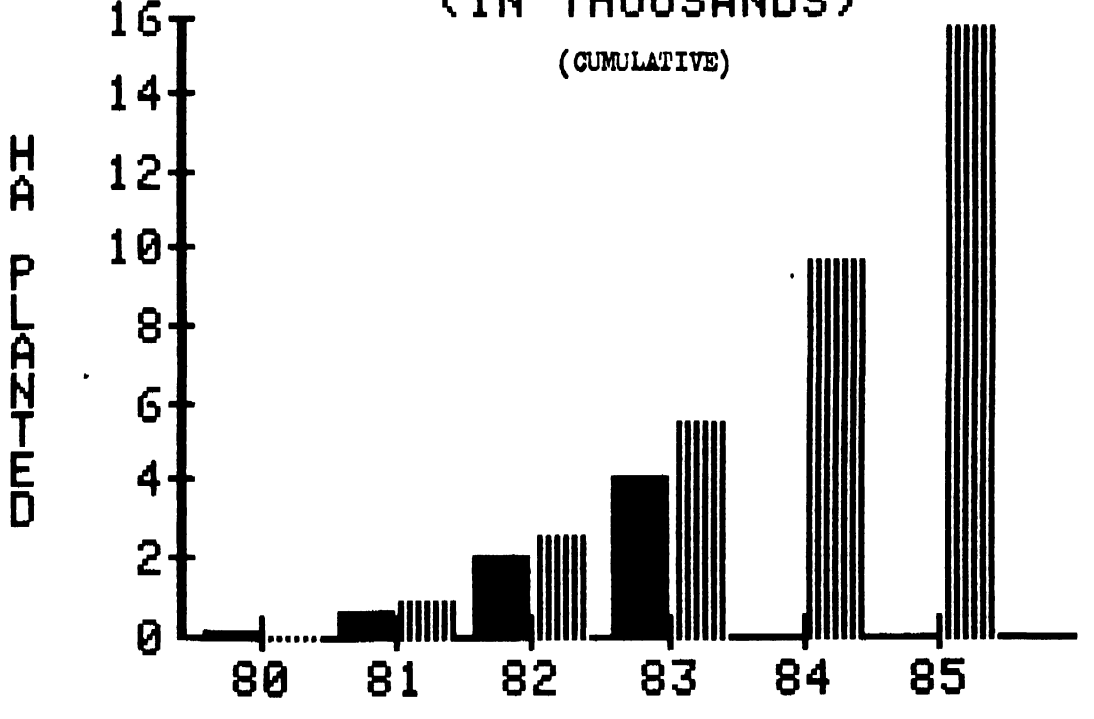



PROJECT PROGRESS
SOLID BAR = ACHIEVED
SHADED = TARGET

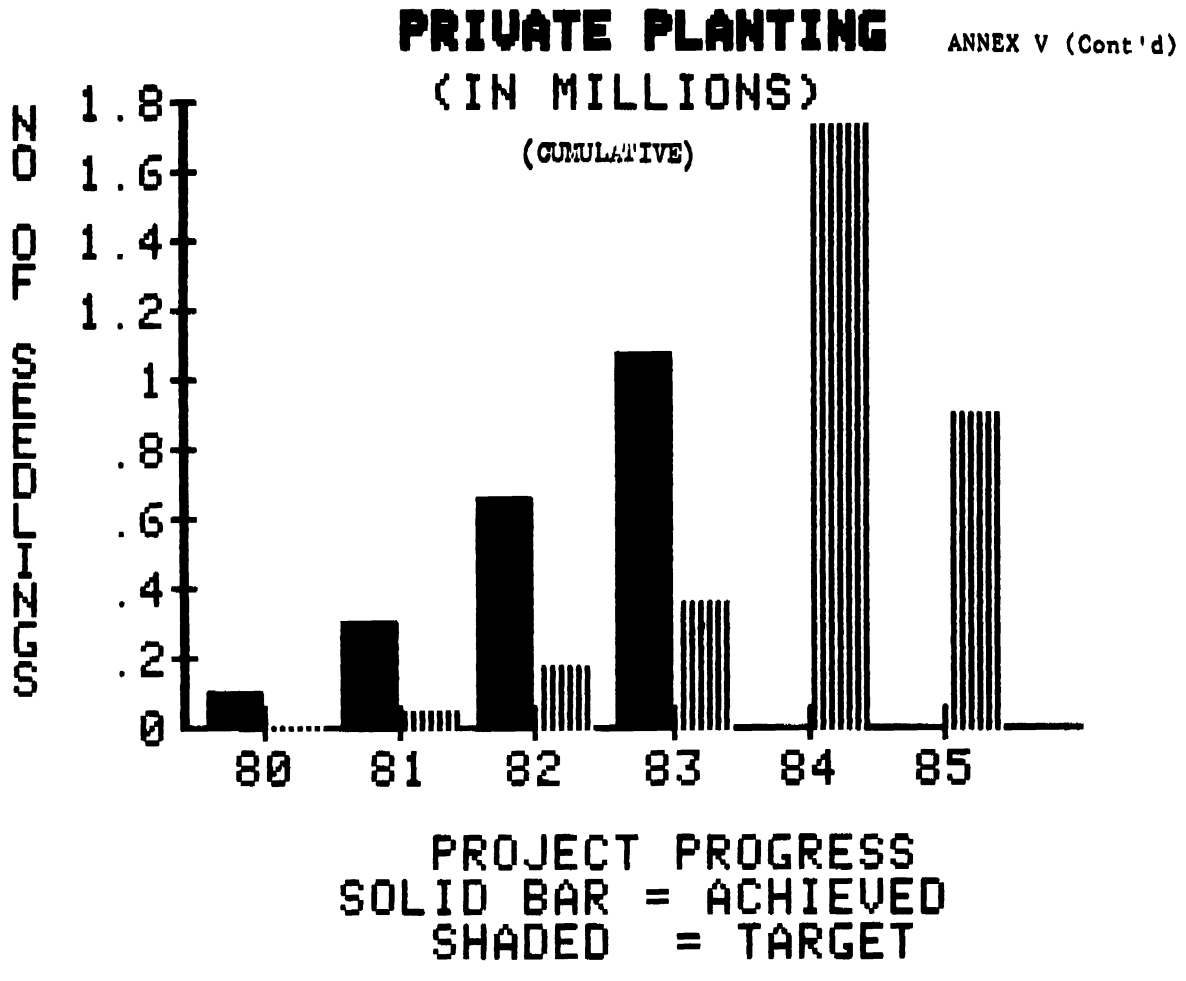
## HECTARES PLANTED

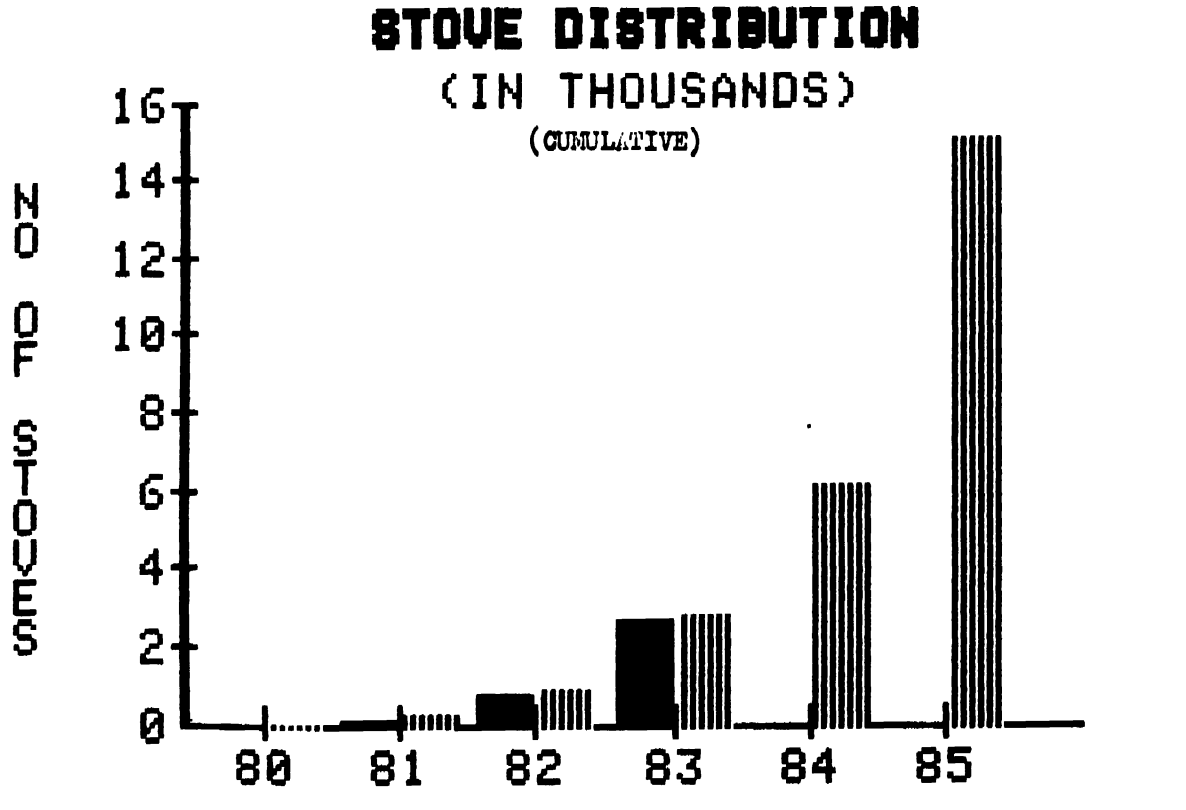
(IN THOUSANDS)

(CUMULATIVE)



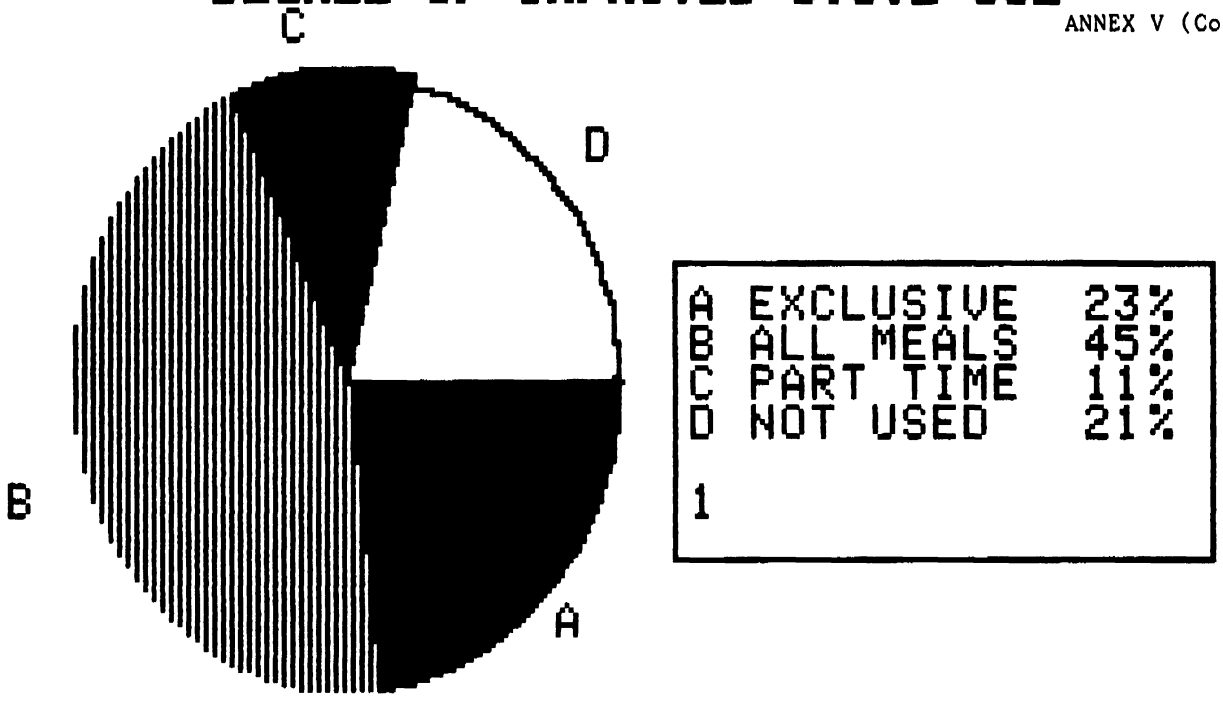
ANNEX V (Cont'd)



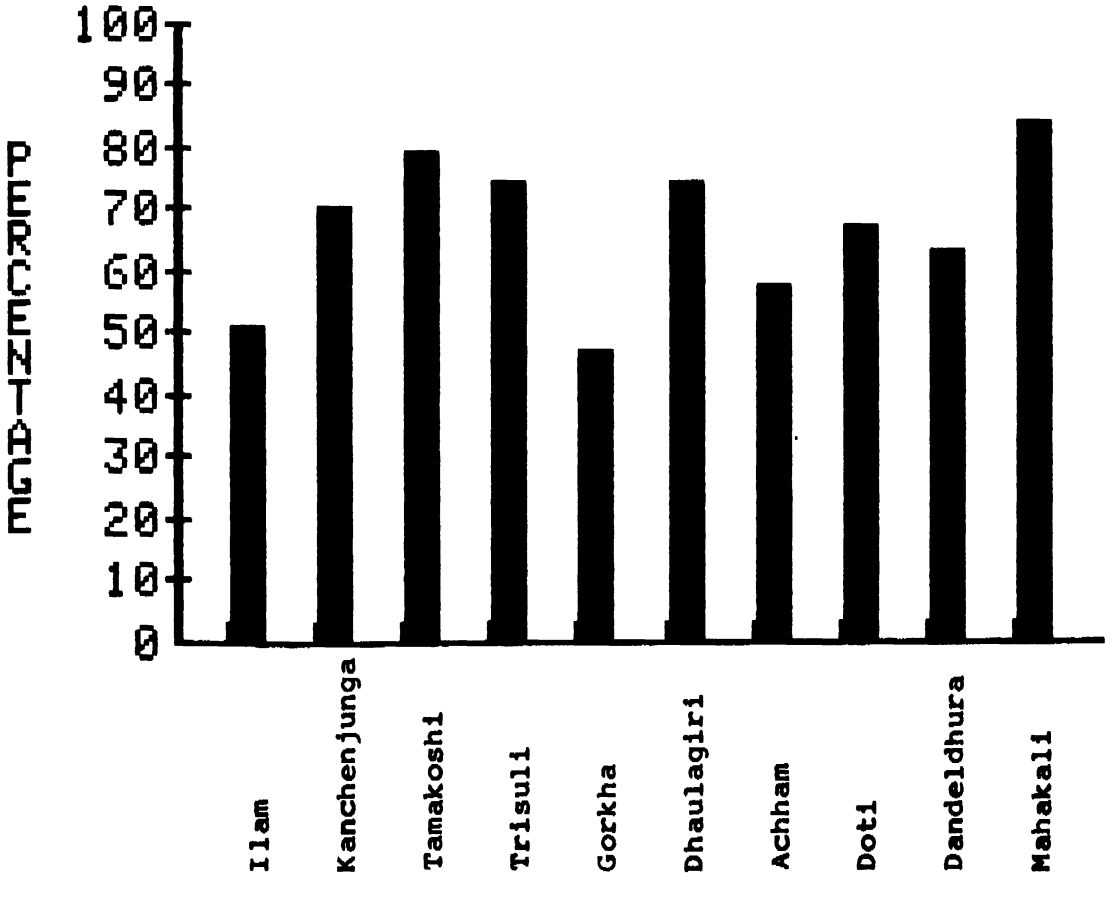



ANNEX V (Cont.)

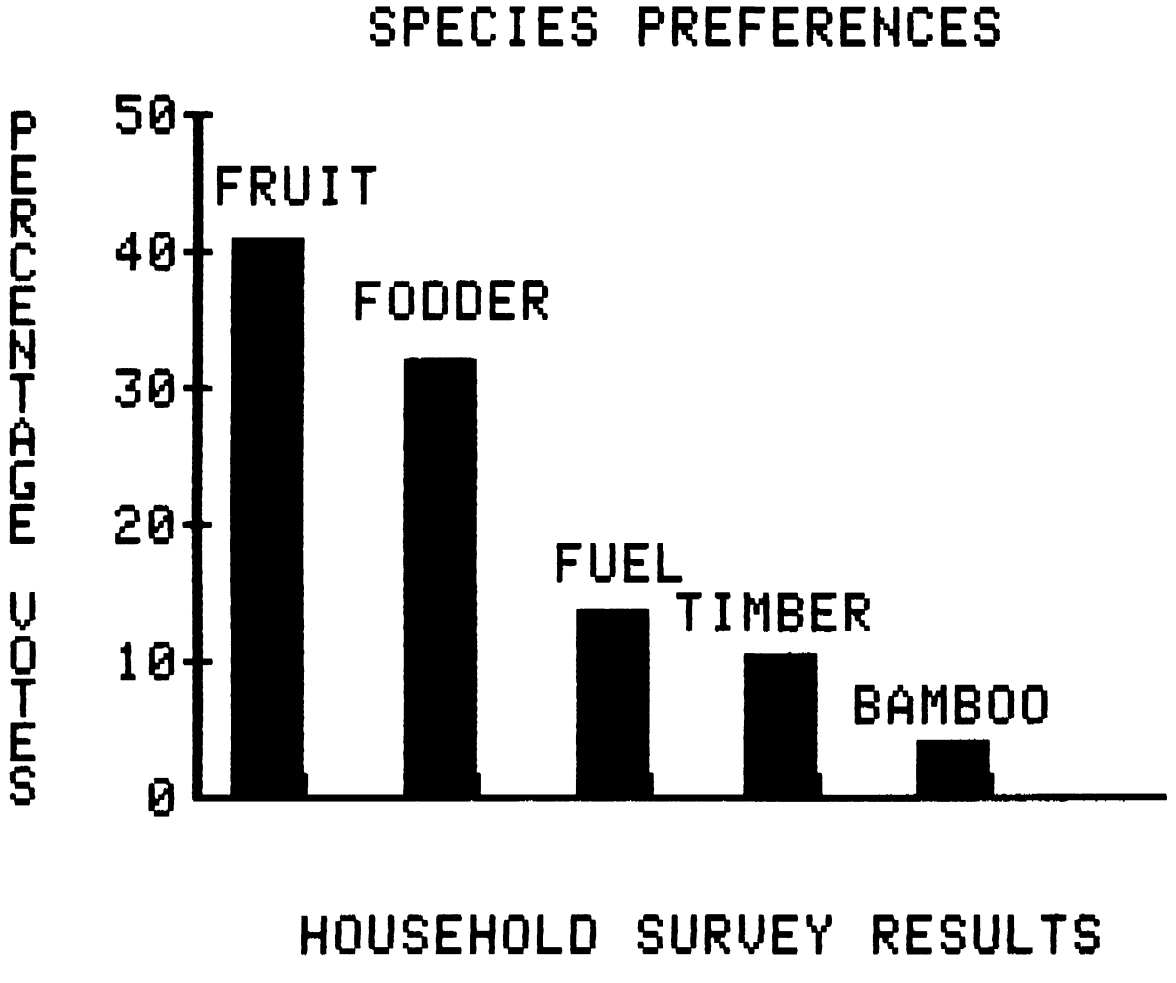
## DEGREE OF IMPROVED STOVE USE



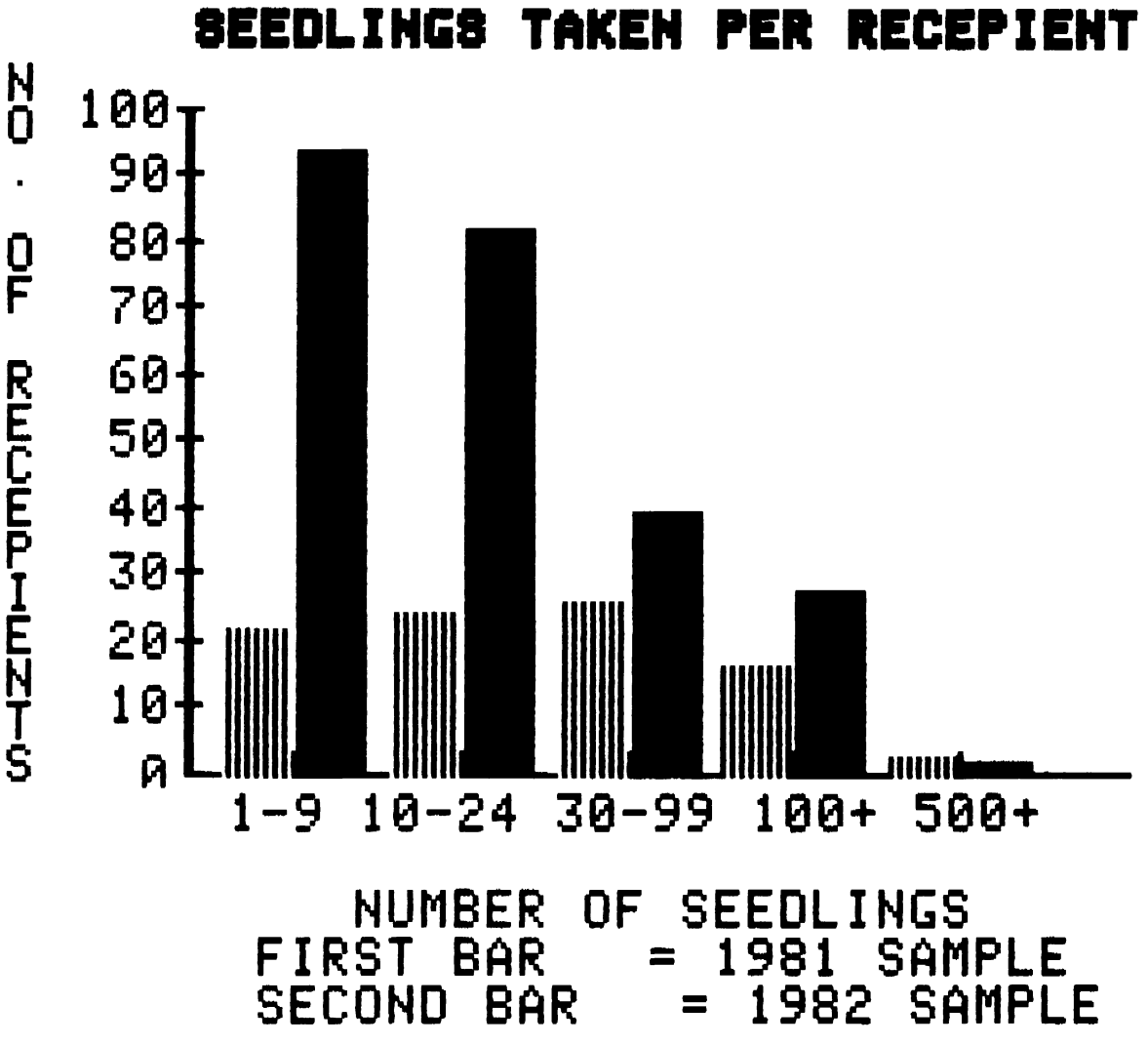

## PLANTATION SURVIVAL RATES



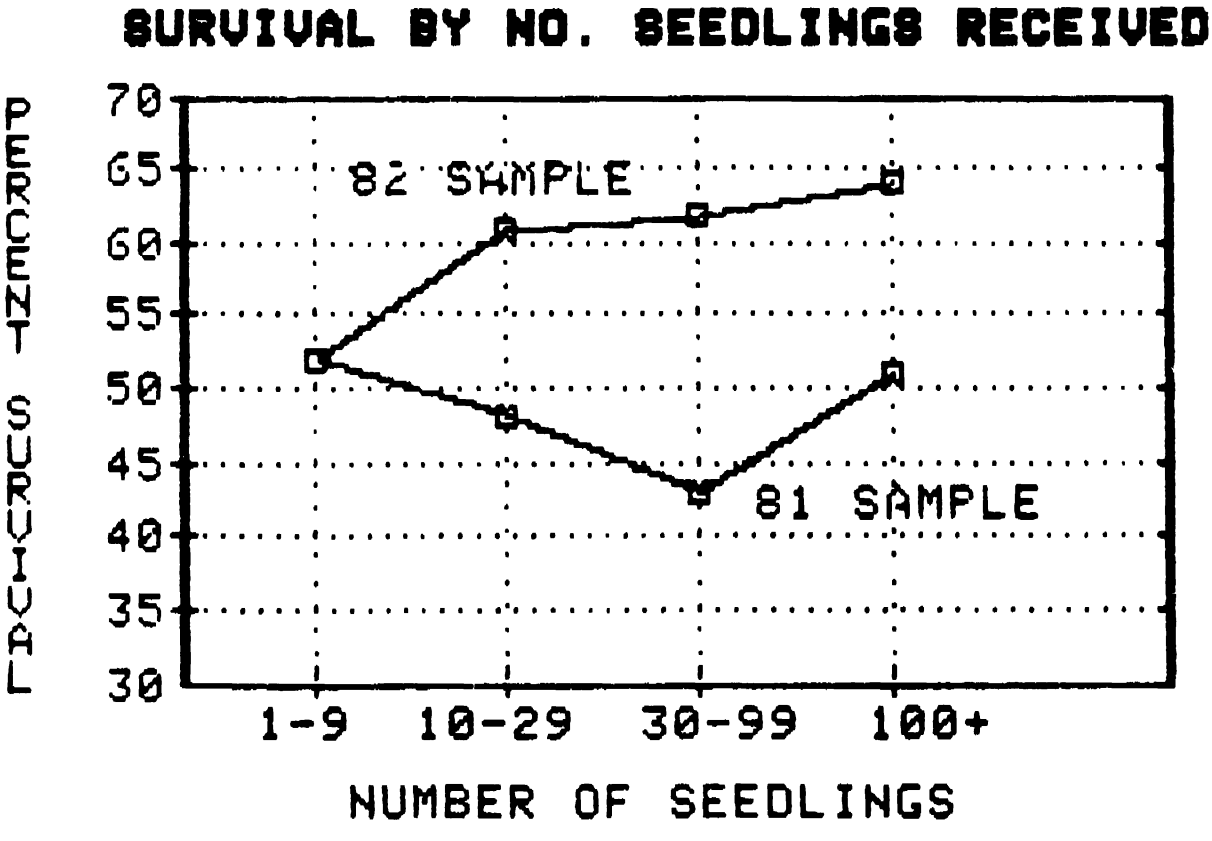
ANNEX V (Cont'd)



ANNEX V (Cont'd)



ANNEX V (Cont'd)



ANNEX VI

SOCIO-ECONOMIC HOUSEHOLD/BASELINE SURVEY

(Sample Pages)

4. Private Trees and Seedlings

| | | | | | |
|---|---|---|---|---|---|
| 4.1 | Trees owned over 5 yrs old | Number | Number naturally regenerated | | Number Planted |
| | 4.1.1 Fodder trees | ____ | /___/ | 4.1.1 | /___/ |
| | 4.1.2 Fuelwood/timber trees | ____ | /___/ | 4.1.2 | /___/ |
| | 4.1.3 Fruit trees (except bananas and pineapple) | ____ | /___/ | 4.1.3 | /___/ |
| | 4.1.4 Bamboo clumps | ____ | /___/ | 4.1.4 | /___/ |
| | 4.1.5 Other (specify) | ____ | /___/ | 4.1.5 | /___/ |
| 4.2 | Trees owned less than 5 yrs old | Number | Number | | Code |
| | 4.2.1 Fodder trees | ____ | /___/ | 4.2.1 | /__/ |
| | 4.2.2 Fuelwood/timber trees | ____ | /___/ | 4.2.2 | /__/ |
| | 4.2.3 Fruit trees | ____ | /___/ | 4.2.3 | /__/ |
| | 4.2.4 Bamboo clumps | ____ | /___/ | 4.2.4 | /__/ |
| | 4.2.5 Other (specify) | ____ | /___/ | 4.2.5 | /__/ |

ANNEX VI (Cont'd)

4.2 Main source code:

1 /__/ Community forestry nursery
2 /__/ Other nursery
3 /__/ Transplanted form own land
4 /__/ Other people
5 /__/ Natural regeneratаion
6 /__/ From forest
9 /__/ Other (specify) _____

4.3 Means of protecting seedlings /__/ 4.3

1 /__/ In fenced area /__/
2 /__/ Individual seedling fences /__/
3 /__/ Grazing controlled
4 /__/ Inaccessible place
5 /__/ Protected by people
9 /__/ Other (specify) _____

| 4.4 Tree species preference | | Species Code |
|---|---|---|
| 4.4.1 For fodder | 1. _____ | /__/ 4.4.1 |
| | 2. _____ | /__/ |
| | 3. _____ | /__/ |
| 4.4.2 For fuel | 1. _____ | /__/ 4.4.2 |
| | 2. _____ | /__/ |
| | 3. _____ | /__/ |
| 4.4.3 For timber | 1. _____ | /__/ 4.4.3 |
| | 2. _____ | /__/ |
| | 3. _____ | /__/ |

ANNEX VI (Cont'd)

## 8. Forest Availability, Management and Perceptions

8.1 Compared to adjoining villages, does your village have more or less forest? /__/ 8.1

1 /__/ More 2 /__/ Less 3 /__/ Same 9 /__/ Don't know

8.2 Has your village's forests increased or decreased in the last five years? /__/ 8.2

1 /__/ Increased 2 /__/ Decreased 3 /__/ Same 9 /__/ Don't Know

8.2.1 (If answer 1 or 3) How? /__/ 8.2.1

1 /__/ Protected by villagers

2 /__/ Protected by Government

3 /__/ Population not increased

4 /__/ New plantations established

5 /__/ More than one answer

7 /__/ Other (specify) _____

9 /__/ Don't Know /__/ 8.2.2

8.2.2 (If decreased) How?

1 /__/ Population increased

2 /__/ Cultivation increased

3 /__/ Uncontrolled cutting

4 /__/ Too much grazing

5 /__/ More than one answer

7 /__/ Other (specify)_____

9 /__/ Don't know

8.2.3 Can villagers save the forests by practicing family planning? /_/ 8.2.3

0 /_/ No 1 /_/ Yes 2 /_/ To some extent

3 /_/ Does not understand family planning

9 /_/ Don't know

8.2.4 Do people in the village practice family planning? /_/ 8.2.4

0 /_/ No 1 /_/ Yes 9 /_/ Don't know

8.2.5 Do you think there should be more forest for your village? /_/ 8.2.5

0 /_/ No 1 /_/ Yes 9 /_/ Don't know

Why? _____

8.2.6 Should existing grazing land be turned into plantation? /_/ 8.2.6

0 /_/ No 1 /_/ Yes 9 /_/ Don't know

8.2.7 If a nearby forest is turned over to your village as a community forest, do you think it could be properly used and protected: /_/ 8.2.7

0 /_/ No 1 /_/ Yes 9 /_/ Don't konw

8.2.8 Has your neighbourhood or panchayat ever had discussion/meeting on forest problems? /_/ 8.2.8

0 /_/ No 1 /_/ Yes, informal

9 /_/ Don't know 2 /_/ Yes, formal

8.3 How many loads of firewood can one person collect from the forest in a day? /_/_/ 8.3

Bhari _____

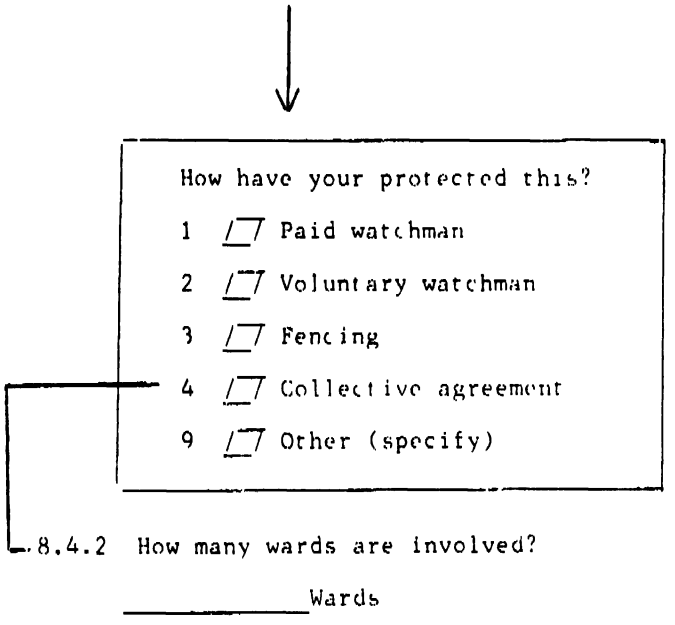
8.3.1 How long does it take to reach the collecting site? /_/_/_/ 8.3.1

Hours _____

8.4 Do you have a locally protected forest? /_/ 8.4

0 /_/ No → END 1 /_/ Yes ↓ 9 /_/ Don't know → END

ANNEX VI (Cont'd)



ANNEX VI (Cont'd)

SOCIO-ECONOMIC VILLAGE LEADER SURVEY
(Sample Pages)

8.2 What percentage of bari land has winter crops growing on it which is protected from grazing? /__/ 8.2

9. Where are the following kinds of private trees mostly grown?

| | | | Code |
|---|---|---|---|
| 9.1 | Fodder | _____ | /__/ 9.1 |
| 9.2 | Fruit | _____ | /__/ 9.2 |
| 9.3 | Fuelwood | _____ | /__/ 9.3 |
| 9.4 | Timber | _____ | /__/ 9.4 |

Codes: 1 = Around bari; 2 = Around khet; 3 = 1 + 2; 4 = Around house; 5 = 1 + 4; 6 = 2 + 4; 7 = Kharbari/forest; 8 = 1 + 7; 9 = 2 + 7; 10 = 4 + 7; 11 = More than 2; 12 = Other

9.5 Is there a nearby market for wood products? /__/ 9.5

1 /__/ Yes 0 /__/ No

(If yes) Fill in the following:

| Product | Name of Market | Distance (in hours) | Trade Volume 1 low | 2 Medium | 3 High | Distance (hr.) | Trade Code |
|---|---|---|---|---|---|---|---|
| 9.5.1 Fuelwood | | | | | | /__/ 9.5.1 | /__/ |
| 9.5.2 Timber | | | | | | /__/ 9.5.2 | /__/ |
| 9.5.3 Other (furniture, tools, etc.) | | | | | | /__/ 9.5.3 | /__/ |

ANNEX VI (Cont'd)

9.6 Do any of the villages in this ward have their own protect forests? /__/ 9.6

1 /__/ Yes /__/ No (if no, go to 10)

9.6.1 (If yes) What percentage of the ward participates in the protection?_____ /___/ 9.6.1

What type of protection is used?

1 /__/ hired watchman 2 /__/ voluntary watchman

3 /__/ fence 4 /__/ voluntary

9 /__/other (specify)_____ /__/

9.6.2 How many years has it been protected? (in yrs.) /___/ 9.6.2

9.6.3 What are the main species in the forest? Species Code

1. _____ /___/ 9.6.3

2. _____ /___/

3. _____ /___/

10. When the following are purchased or exchanged in kind, what is the average price (convert exchanges to rupees)? Rs.

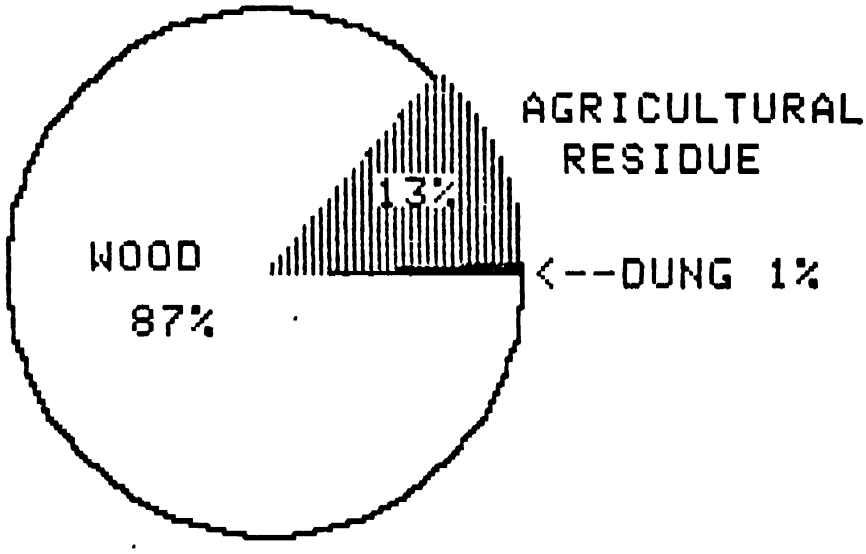
| | | | |
|---|---|---|---|
| 10.0 | 25 Kg (1 bhari) fuelwood | Rs. _____ | /___/ 10.0 |
| 10.1 | 1 bamboo pole | Rs. _____ | /___/ 10.1 |
| 10.2 | 25 kg of rice straw | Rs. _____ | /___/ 10.2 |
| 10.3 | 25 Kg of grass | Rs. _____ | /___/ 10.3 |
| 10.4 | 25 Kg of leaf fodder | Rs. _____ | /___/ 10.4 |
| 10.5 | 25 Kg of bedding | Rs. _____ | /___/ 10.5 |
| 10.6 | 25 Kg of manure | Rs. _____ | /___/ 10.6 |
| 10.7 | 1 pathi unhusked rice | Rs. _____ | /___/ 10.7 |
| 10.8 | 1 pathi maize | Rs. _____ | /___/ 10.8 |
| 10.9 | 1 pathi wheat | Rs. _____ | /___/ 10.9 |

ANNEX VI (Cont'd)

SOCIO-ECONOMIC HOUSEHOLD/BASELINE SURVEY

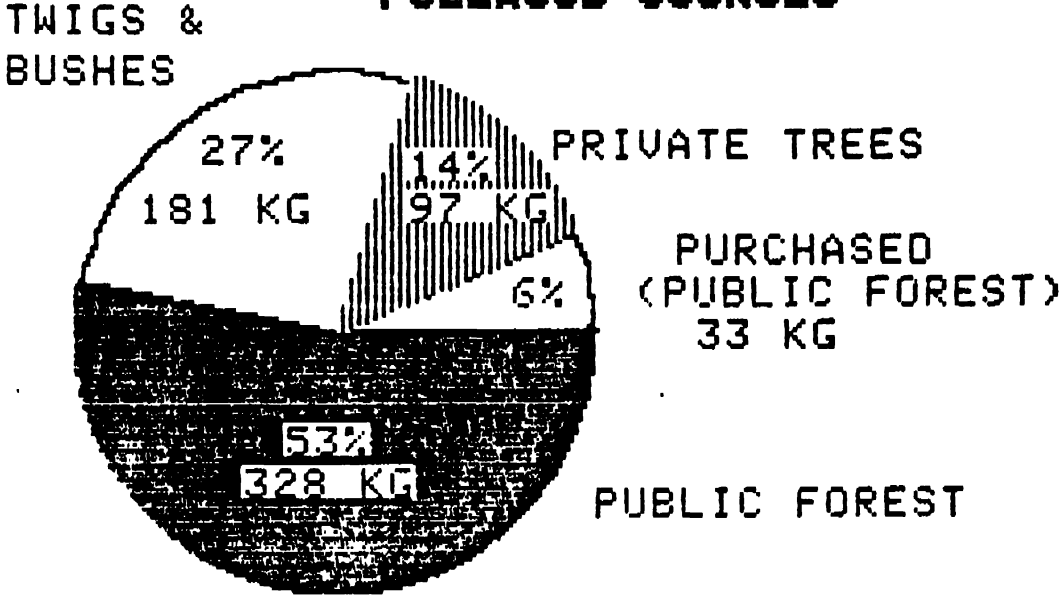
EXAMPLE OF FINDINGS

## FUEL CONSUMPTION PER CAPITA



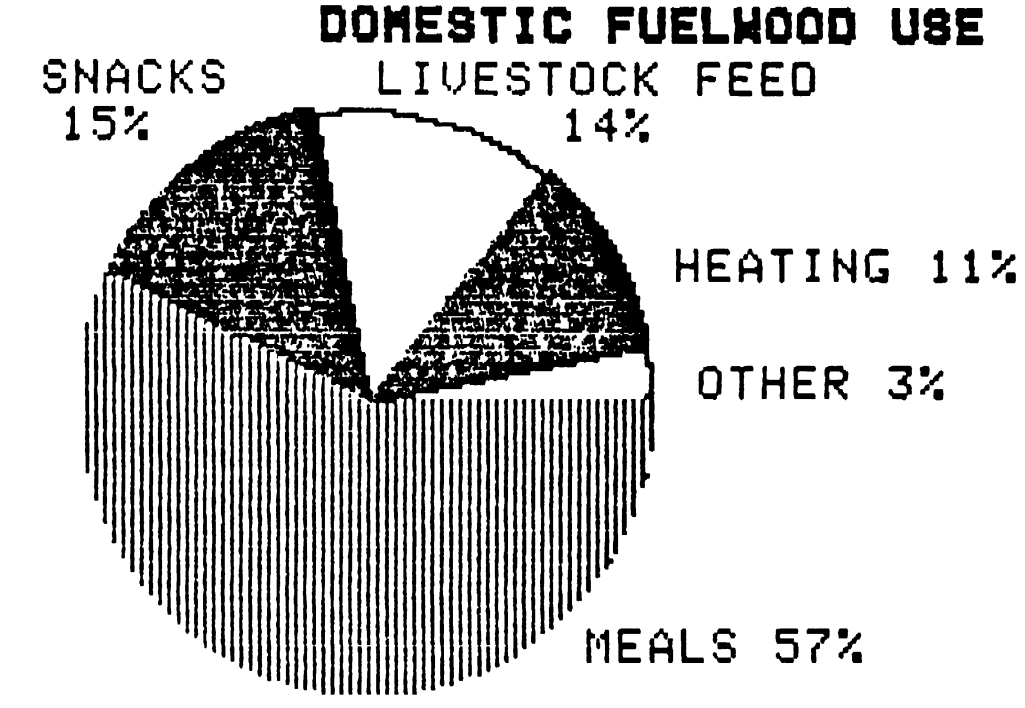

TOTAL = 738 KG. PER CAPITA

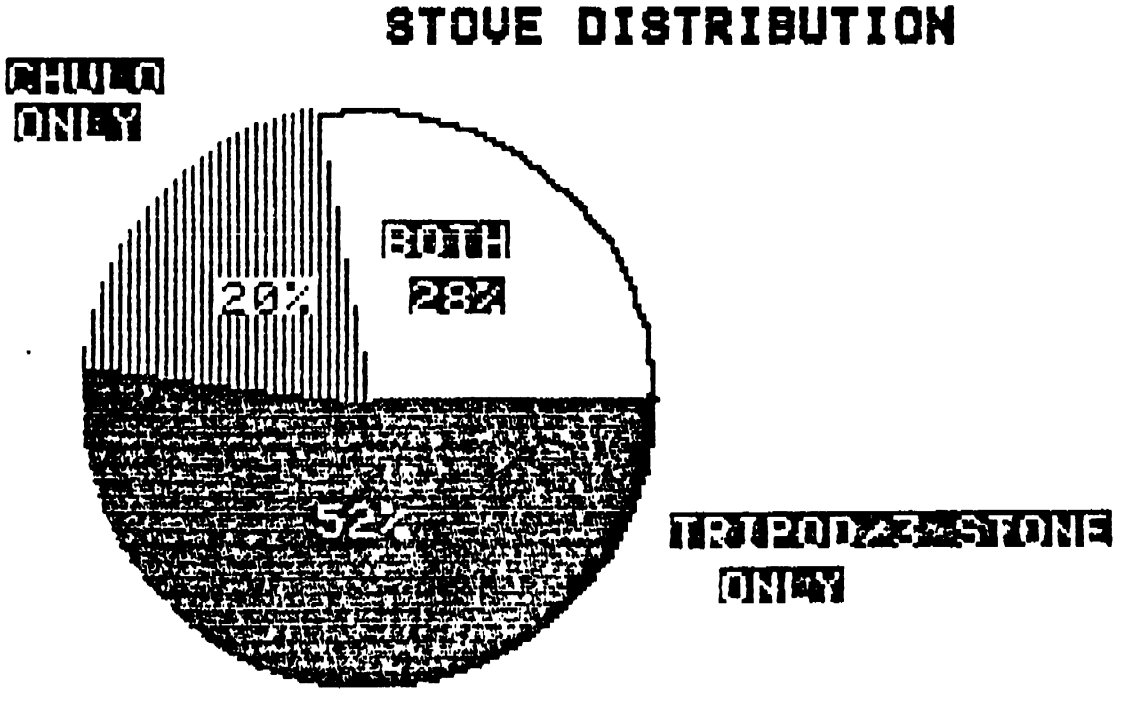
## FUELWOOD SOURCES



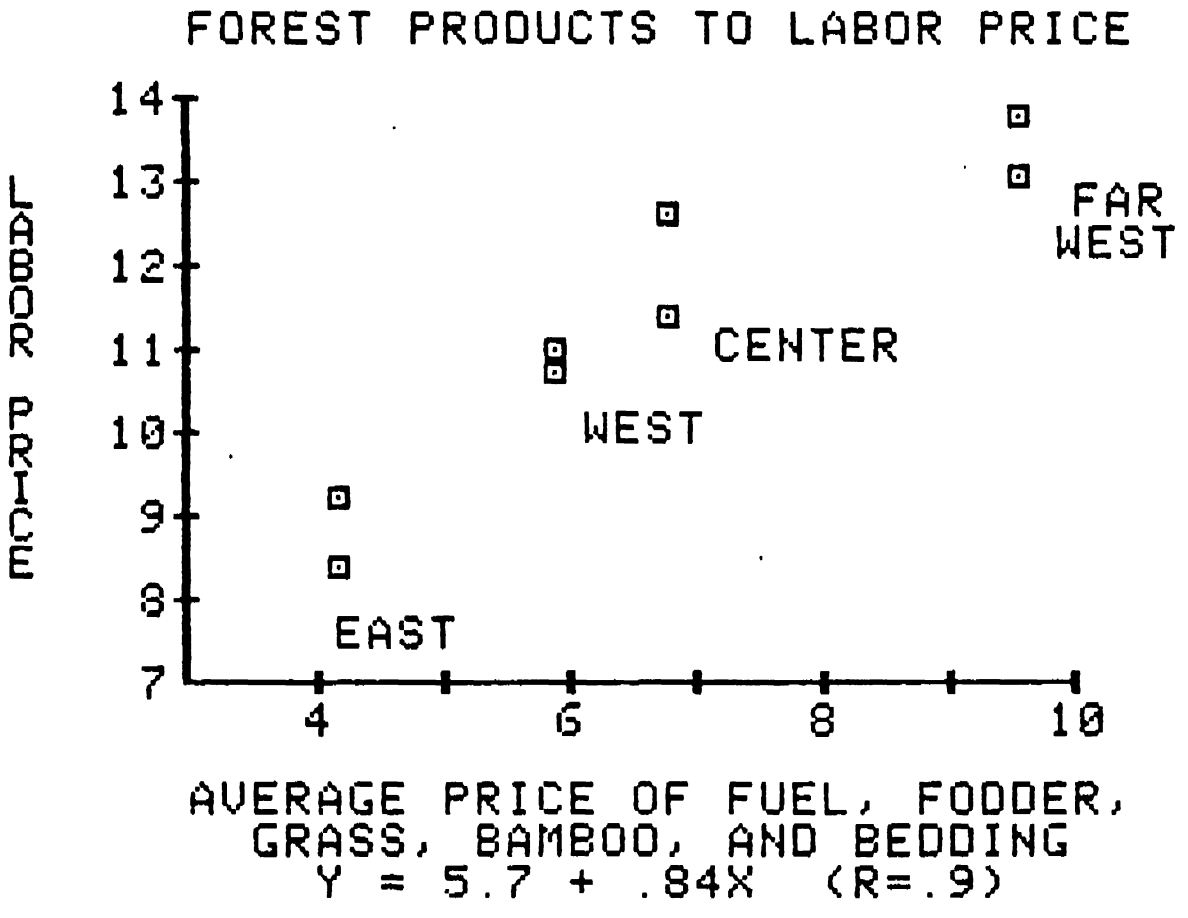

TOTAL FROM PUBLIC FOREST: 59%
OR 361 KG

ANNEX VI (Cont'd)



ANNEX VI (Cont'd)



TREE OWNERSHIP BY REGION BY HOUSEHOLD

| Type | East | Centre | West | Far West | Hill Nepal |
|---|---|---|---|---|---|
| Fodder | 13.5 | 9.4 | 16.7 | 8.6 | 12.1 |
| Fuel/Timber | 12.8 | 9.2 | 17.8 | 7.4 | 11.9 |
| Fruit | 2.2 | 2.2 | 1.6 | 3.9 | 2.4 |
| Bamboo clumps | 5.3 | .9 | 1.3 | .03 | 1.7 |
| Total Trees | 33.8 | 21.7 | 37.4 | 20.0 | 28.1 |
| Total Seedlings | 53.0 | 27.0 | 36.0 | 10.0 | 30.8 |

SOURCE OF TREE SEEDLINGS

| Tree Type | CFAD Nursery | OTHER Nursery | OWN Land* | Natural Regeneration | Forest | Friends |
|---|---|---|---|---|---|---|
| Fodder | 0.8 | 0.1 | 38.5 | 49.4 | 5.8 | 3.0 |
| Fuel/Timber | 0.3 | 0.7 | 14.6 | 76.4 | 3.6 | N/A |
| Fruit | 1.2 | 3.8 | 20.6 | 13.1 | 1.2 | 32.3 |
| Bamboo | 4.8 | 0.8 | 27.8 | 2.4 | 0.8 | 15.1 |

* Transplanted from own land.

# MONITORING AND EVALUATION OF THE MALAWI WOOD ENERGY PROJECT

by

David French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## 1. BACKGROUND

The idea of a Malawi Wood Energy Project took root in early 1978. More than a year later, after planning was substantially complete, it was decided to add an Energy Studies Unit (ESU) to the Project. Although the ESU would ultimately carry out much of the Project's monitoring and evaluation, it was initially placed in a division separate from the one controlling most Project activities. Only in 1982 was the ESU fully integrated into Project administration. This history was to have very significant implications for the ESU and the Project.

### A. Origins of the Wood Energy Project

In 1978, the Malawi government and the World Bank began discussions of a national Wood Energy Project. A preparation document was completed later that year and appraised by the Bank in 1979. The Bank's staff appraisal report was issued in 1980, and the Project got underway four months later.

The rationale for the Project is succinctly stated in the appraisal report: "At present consumption rates, the demand for fuelwood and poles is expected to double in 25 years, while existing supplies would have virtually disappeared... The only practical solution appears to be to establish fuelwood and pole plantations as far as possible..." Government would establish some of these plantations. In addition, "It is clear that each rural household would have to grow its own woodlot in order to supply its domestic needs."

In pursuit of these goals, Government was to plant 12 900 hectares of trees "to cater for the needs of the commercial and industrial sector and some of the affluent urban dwellers". Some of the plantations (2 400 ha) were to be controlled by Districts and Town Councils, although most of the land involved (10 500 ha) was to be planted by the Forestry Department itself. Most trees were to be various Eucalyptus species.

In principle, wood prices were to be based on full recovery of production costs. However, this would have required a sharp increase in the charges in force when the Project began. Anticipating a great drop in demand for plantation wood at these higher prices, Government increased its charges only gradually during the project period. By 1984, the price of plantation firewood was about 10% of its production cost.

To enable households to do their part, 88 nurseries were to be established throughout the country, each selling 100 000 tree seedlings annually to farmers. Most seedlings were to be Eucalyptus, with a scattering of other species (e.g., Gmelina arborea) in small numbers. Although the appraisal report again emphasized the principle of cost recovery, project management estimated that sales would be very limited at any price greater than $.01 per seedling. This price was generally adhered to for sales to farmers, even though actual production costs averaged more than $. 07 per seedling over the period 1980-1984.

In line with Forestry Department policy, sales targets were set with the idea of making farmers self-sufficient in the production of fuelwood and poles. The appraisal report estimates that an average household would have to plant 1 000 seedling to achieve

self-sufficiency, and goes on to note that "The annual seedling production of a nursery would therefore be ... the equivalent of the annual domestic needs of 100 households".

To increase the farmers' interest in tree-planting, the Project's nurserymen were to devote half their time to "extension". This work was to consist of marketing seedlings and telling farmers how to plant and tend them. In addition, it was noted that assistance from agricultural extension staff would be helpful in reaching farmers outside the nurserymen's areas of operation. This latter approach was given only cursory attention, however, and no funds were allocated to pursue it.

By way of summary, it is worth stressing that the Project's objective was a simple one: to plant trees. Thus, the appraisal report emphasizes that 12 900 ha of Government plantations were to be established and enough seedlings sold to farmers to plant 15 200 ha more. All going well, the Project would therefore leave behind 28 100 ha of new trees. This would reduce the serious imbalance between national tree consumption and the annual growth of new wood in existing forests.

## B. Origins of the Energy Studies Unit

In May, 1979, following the World Bank's field appraisal of the Wood Energy Project, the idea was mooted of adding a "rural energy utilization study" to the Project. After some discussion, it was decided to create an Energy Studies Unit to "carry out a variety of studies required for the planning of possible future wood energy projects, investigating the possibilities for reducing wood consumption through improving utilization efficiency and developing other renewable energy resources".

At this point, the ESU's rather unfocussed set of duties seemed only peripherally related to the Project's immediate work of planting trees and growing seedlings. As a result, it was decided to place the ESU in the Planning Division of the Ministry of Agriculture and Natural Resources (MANR), not in the Wood Energy Division where most Project activities would be centered.

Then came a crucial intervention, in the form of a special FAO/World Bank mission to assit in the design of the surveys that the ESU would carry out. Following a visit to Malawi in September, 1979, the mission issued a lengthy report on the ESU's proposed work programme. For the first time, this report explicitly introduced the idea of formal project monitoring. For example, the mission recommended that the ESU monitor the response by farmers to the Project's extension and nursery activities. This would provide feedback to management on Project success, as well as supplying information needed to plan future projects. Even more important, however, the mission specified a number of variables to be monitored as general background for considering present and future wood energy issues. For example, prices of firewood and charcoal were to be monitored. In rural areas, the ESU was to study current patterns of energy use, the extent and consequences of fuelwood shortages, and future prospects for fuelwood production.

The ESU was later to term this kind of work "context Monitoring and Evaluation", as opposed to conventional "project Monitoring and Evaluation." In monitoring the context of a social forestry project, attention is given to the situation, attitudes and activities of wood-users and wood-growers in general, whether or not the project considers them among its targets. In the ESU's case, the purpose was to understand not just Malawi's Wood Energy Project, but Malawi's wood energy situation.

Once committed to this line of inquiry, the ESU became problem-centered rather than project-centered. For example, instead of concentrating on seedling sales in relation to project targets, the ESU was to be more concerned with whether lack of access to seedlings was a serious barrier to tree-planting in the first place. In other words, the ESU's job was less to measure the project's fulfillment of its targets than to tell whether the targets themselves were responsive to the larger context within which the project was being carried out.

C. Relationships between the ESU and the Wood Energy Project

The Energy Studies Unit began its work in September 1980 with World Bank financing. In line with earlier decisions, the ESU's senior officer reported to the director of the Planning Division of the Ministry of Agriculture and Natural Resources. This encouraged the broad concentration on planning, evaluation, and rural development issues that had been implicit in the FAO/World Bank report. At the same time, the Wood Energy Division (WED), located within the MANR's Forestry Department, was moving to establish plantations and seedling nurseries.

The distance between the ESU and the WED widened in 1981, when the MANR was split into two nurseries: a Ministry of Agriculture (within which the ESU remained) and a Ministry of Forestry and Natural Resources (including the Forestry Department and its WED). It was not until 1982 that the ESU was transferred out of the Ministry of Agriculture and into the Wood Energy Division.

During its initial 20 months, ESU staff attended Wood Energy Project management meetings and worked closely with the project on various studies, including the feasibility of plantation-based charcoal production and attitudes of farmers to project nurseries. Nonetheless, its administrative distance from the proejct allowed the ESU to establish a relatively independent work programme.

These events led the ESU and project management to rather different perspectives on wood energy. Management was naturally most concerned with the attainment of project targets. The ESU, on the other hand, began to look closely at key aspects of the project's larger context; e.g. farmer's perceptions of the wood energy situation, as well as their responses to this situation; patterns of fuel use in rural and urban areas; wood use and tree-planting by tobacco estates; features of rural life to which a forestry extention programme must respond; and so on.

This meant that the ESU would first investigate Malawi's wood energy situation, and only then monitor and evaluate the project's responsiveness to this situation. By thus allowing the ESU to view the project on its broader context, the initial, fortuitous separation between ESU and project greatly enhanced the ESU's usefulness.

TABLE A: ENERGY STUDIES UNIT WORK PROGRAMME

| SECTOR | INFORMATION REQUIRED | STUDIES |
|---|---|---|
| I. RURAL HOUSEHOLDS (c.59% of total wood energy use) | A. current patterns of energy use, including impact of wood energy scarcities | A. rural energy surveys (1981,198-) |
| | B. patterns of tree-planting, including constraints, attitudes toward Project, etc. | B. tree-planting survey (1982) Shire Valley survey (1983) seedling sale surveys(1982-198-) |
| | C. potential improvements in efficiency of wood use | C. mudstove test reports (198-, 1983, 1984) |
| II. URBAN HOUSEHOLDS. COMMERCIAL AND INDUSTRIAL) (c.2% of total wood energy use) | A. current patterns of energy use, including consumption estimates and trends | A. urban energy survey (1984) |
| | B. prices and marketing system for wood and charcoal | B. firewood and charcoal marketing surveys (1981-1985) |
| | C. cost of Government plantation wood | C. stumpage cost estimates (by Financial Controller) |
| | D. potential improvements in efficiency of wood use | D. charcoal brazier test reports (1985) |
| | E. charcoal production (household and industrial demand, kiln efficiencies, potential improvements, economic feasibility, etc.) | E. charcoal reports (1982, 1984) |
| | F. wood availability | F. inventory of wood supplies for urban areas (by Management Services Division, 1984) |
| III. TOBACCO CURING (c. 23% of total wood energy use) | A. current patterns of energy use, with emphasis on barn efficiencies and improvements | A. smallholder barn tests (1983-5) tobacco estate survey (1984) |
| | B. patterns of tree-planting by tobacco-growers, including constraints, etc. | B. tobacco estate survey (1984) smallholder survey (1984) |

## 2. ORGANIZATION OF THE ENERGY STUDIES UNIT

Given the orientation described above, the ESU did not define "monitoring and evalutation" in the usual fashion, as a way to consider Project inputs, effects and impacts, objectives, targets, and so on. Instead, Monitoring and Evaluation meant keeping track of significant wood energy realities, in a broad context including aspects which were not directly related to the Project. Evaluation was taken to imply careful thought about Malawi's wood energy situation and what might best be done about it. According to the ESU, only when these matters were understood could the appropriateness of Project activities be judged.

The ESU also redefined "the wood energy situation". For Project planners and management, "the situation" consisted of the deficit arrived at by subtracting national wood consumption from national wood production. To deal with a situation defined in this way implies planting enough trees to close the deficit. As noted earlier, this is the way the Wood Energy Project set forth its objectives.

For the ESU, by contrast, "the wood energy situation" meant the needs, problems and activities of major wood-users. In other words, at the heart of the situation were the people using the trees,not the trees themselves. this view was to influence the ESU's work programme, findings, conclusions, and impact on the Project.

### A. Work Programme

As shown in Table A, the ESU first divided wood users into three main groups: rural households, urban users (households, commercial, and industrial), and tobacco curers. The assumption here is that each group is a roughly coherent unit in terms of its wood energy problems and the package of Government initiatives that might be appropriate in response. Together, these three groups account for almost 94% of all wood energy used in Malawi. Since all other wood users (tea and sugar estates, brick-makers, etc.) together use only about 6% of Malawi's wood energy, any investigation of their problem was left until a later phase of the Project.

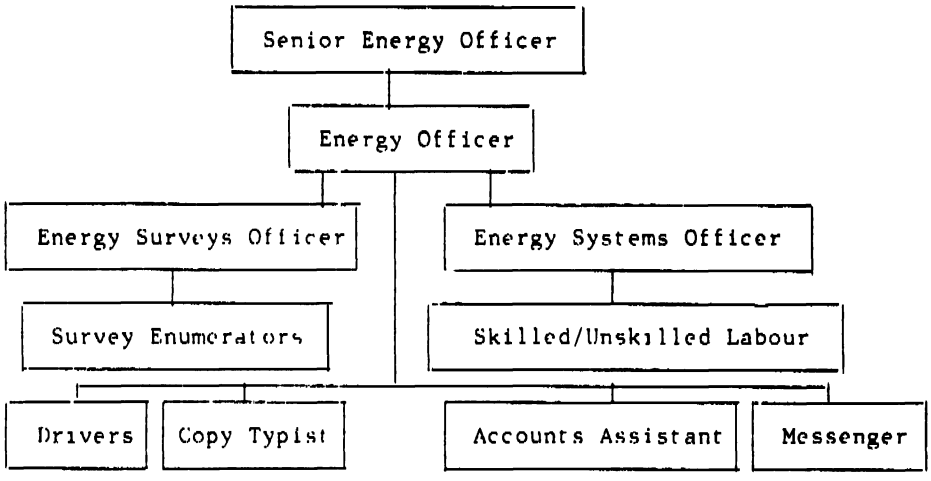
Next, the ESU outlined the information needed to understand the situation of each group, especially in terms of current energy use and tree-planting, as well as potential improvements in the efficiency of wood use. This done, the ESU was able to set forth a programme of studies to provide the required information.

Although details will follow in later sections, it is worth underscoring here some of the information that the ESU made a point of including (or excluding). For example, the ESU was concerned not only with current patterns of energy use, but also with the reactions of people in both urban and rural areas to wood energy shortages. This assumes that Government actions with respect to wood energy must largely build on the feelings that individuals have about their own situation, as well as the initiatives they have already begun to take in response. As will be shown, this is especially true when it comes to farm forestry.

The work programme outlined in Table A provides for an inventory of wood supplies for urban areas, but makes no such provision concerning wood supplies for rural households or tobacco growers. In the latter two cases, it was assumed that Government policy would be exactly the same (e.g. provision of extension services to encourage tree-planting and more about wood availabilities in order to decide whether to establish plantations of its own.

## B. Structure Staffing and Expenditure

Given its work programme, the ESU required staff with a wide range of skills. Early on, it was decided to give roughly equal weight to surveys and to testing of energy systems. These activities would be supervised by officers with a broad knowledge of planning and economic analysis. This approach implied the following staffing pattern:




To ensure the proper background the Senior Energy Officer and Energy Officer were to be graduates of Malawi's Chancellor College, with an academic concentration on economics and sociology. The Energy Surveys Officer was to be a diploma graduate from the Bunda College of Agriculture, which gives special attention to extension and rural development issues. The Energy Systems Officer was to be a diploma graduate in engineering from the Malawi Polytechnic. The ESU's access to these varied skills was to have very positive results. Since everyone was working out of the same offices, they constantly were able to pass information back and forth and to consult on the problems of the day. The resulting studies were comprehensive and tightly woven in a way that is difficult to imagine emerging from any other sort of process.

For example, everyone shared responsibility for a major charcoal study: the Energy Officer reviewed industrial demand for charcoal; the Surveys Officer investigated urban uses of charcoal and the charcoal marketing system; the Systems Officer tested a wide range of production and coordinated the report as a whole. On a lesser scale, this sort of thing was happening all the time. When the Surveys Officer was considering the implications of a shift from wood to charcoal for cooking in urban areas, the Systems Officer was able to test for him the relative efficiencies of the stove typically used with each fuel. When the Systems Officer tested his improved mudstoves in villages, a survey enumerator went along to ask questions of the women involved about fuel use and cooking practices. And so on.

As its work progressed, the ESU found itself increasingly concerned with agroforestry, forestry extension, and other issues requiring silvicultural expertise. In 1984, the ESU therefore added a Senior Forester to its staff.

Over the five years of the Project (1980-1985), the cost of the ESU's programme was to be about U.S.$1 million, or about 10% of the total cost of the Wood Energy Project. Roughly two-thirds of the ESU's expenses represent the cost of office and workshop space and staff housing (for five senior and five junior officers),plus the services for four years of the expatriate who initially filled the post of Senior Energy Officer. The remaining $350 000 was to be absorbed by the cost of vehicles, salaries and wages, training, travel, supplies and equipment, etc. Recurrent costs anticipated at the end of the Project were about $75 000 per year.

These figures are not easily comparable with expenditures by monitoring and evaluation units elsewhere. For one thing, only part of the ESU's money was spent on monitoring and evaluation. The ESU also carried out such other tasks as forestry extension training, agroforestry research, and energy systems testing1/. Moreover the figures given above include technical assistance as well as the cost of offices and staff housing, items that are often excluded in reporting expenditures on monitoring and evaluation.

It is difficult to assess the cost-effectiveness of the ESU's work. The ESU often presented views that would not have been heard in its absence. To the extent these views influenced the Project and the planning of its second phase, the ESU's work had obvious (if unquantifiable) multiplier effects. To judge what the effects might have been, it is necessary first to consider what the ESU had to say.

## 3. ESU STUDIES

The issues posed by the ESU's approach were of most apparent with respect to the situation of rural households. The project assumed that rural households would each have to plant enough trees to become self-sufficient in wood production. Four reasons were given to explain why this was not already hapenning. First, farmers did not fully understand the wood energy problem. Second, farmers were unable to get the tree seedlings they needed to deal with the problem. Third, they did not know how to plant and care for trees. Fourth, they did not have the land necessary for planting.

In response, the Project was to provide 8.8 million seedlings annually for sale to farmers. In support of this programme, an extension system would explain to farmers their need to trees and how to plant them. The issue of finding the land on which to do this was not considered.

As the Project proceeded, however, it became clear that something was not right. During its first year, the Project sold only 100,000 seedlings to smallholders, or about 1% of targets. This was not viewed as alarming, since not all nurseries had yet been opened and publicity for the programme was just getting underway. However, concern began to grow when seedling sales to smallholders rose to only 890,000 in the Project's second year and then fell to 860,000 in the following season. Only in the Project's fourth year did smallholders buy as many as one million seedlings; and even then the nurseries were meeting only 10-12% of their sales target 2/.

For the first couple of years, various reasons were advanced to explain disappointing sales: drought, army worm infestations, petrol shortages, the lack of receipt books at nurseries, inadequate publicity, and so on. It was always assumed that the original targets were valid and, all going well, would soon be met.

---

1/ The ESU also looked at other issues bearing on energy use. These included the analysis of the potential for wood savings through the introduction of improved stoves, and of actions aimed at meeting urban demand of fuelwood and poles generated by industrial users. Because the project components were not directly related to participatory activities they are not described here, but short accounts can be found in Annex III.

2/ The project sales were about 2.5 million seedlings in 1984, still way below targets.

## A. Rural Energy Survey*

Throughout 1981, the National Statistical Office carried out a National Sample Survey of Agriculture (NSSA). The ESU was able to add a set of questions to NSSA dealing with the types of fuels used to do various jobs, the degree of difficulty in obtaining fuels, and the responses to fuel scarcity*. Twice during the year, each of the NSSA enumerators asked these questions to seven women in the village where he was stationed. Since there were 344 enumerators nationwide, this means that 2,408 families were interviewed in each round of the survey. Data were then processed by the ESU on a mainframe computer at the Data Processing Unit, using a programme written for this purpose by the Ministry of Agricultures' Senior programmer.

The survey confirmed the importance of firewood, which is the dominant energy source for all rural household tasks except lighting (for which paraffin is used). Most families felt that wood had become more difficult to find over the previous five years.

In spite of growing problems with firewood collection, however, the survey found that people had not yet begun to cut back on such wood-consuming tasks as cooking, brewing beer, or heating water. Nor had any significant number of people been forced to purchase firewood or turn to crop residues and other inferior fuels. By way of summary, the ESU noted "one basic reality: in most rural areas of Malawi, the firewood problem is not yet felt to be acute".

According to the survey, many smallholders were already planting trees. However, these were largely being planted for uses other than firewood, notably for building poles. Since farmers did not feel they had a firewood crisis, this pattern of planting could continue for some time.

Instead of becoming self-sufficient in firewood and poles (as the Project had expected), some farmers might therefore seek to become self-sufficient in pole production alone. Since poles account for less than 15% of trees consumed in rural areas, the Project might expect to meet less than 15% of its targets, selling perhaps 1.25 million seedlings each year. Even allowing for the possible effects of an active extension programme, the ESU concluded, sales could not be expected to rise above two million seedlings in any Project year.

The ESU circulated its analysis in January, 1982, well before the end of the Project's first complete sales season. As subsequent events were to show, the ESU's estimate was much more accurate than the Project's had been. The difference lay in the information on which the predictions were based. Due to pressures of time and money, there had been no opportunity during project preparation to gather data on the wood energy situation in rural households. The Project's optimistic sales estimates were therefore based on the hope that farmers would respond appropriately to a firewood crisis, as perceived by Project planners. Only when the farmers themselves were later consulted by the ESU was it possible to gauge the situation as they perceived it and to arrive at realistic targets.

## B. Smallholder Tree-Planting Survey*

In order to refine its analysis, the ESU carried out a national tree-planting survey during the first half of 1982.* Since men have the greater responsibility for tree-planting (as opposed to wood use), the questionnaire was administered to men in 1,748 household across the country. Quesrions were asked by the ESU's own team of six enumerators, supervised in the field by the Energy Surveys Officer. Data were processed by the ESU itself, using Paramount cards.

* See Annex I for questionnaire.

The survey concentrated on attitudes toward deforestation and its consequences, current tree-planting activity, and possible constraints to additional tree-planting. Special attention was given to the reasons advanced for the limited amount of planting: the farmers' lack of awareness, seedling, silvicultural knowledge and land.

Contrary to assumptions, the tree-planting survey confirmed that people were quite aware of wood scarcities. The men interviewed faced especially acute problems, since the building poles they collect become scarce even faster than firewood when land begins to be stripped of trees. Nationwide, 82% of men interviewed said that it was difficult to get poles, and 57% found it necessary to buy at least some of their poles rather than simply collecting them.

In response, many people were already planting trees, at a national rate of perhaps 7-10 million per year. Over the previous five years, almost 40% of all families had planted trees for poles or firewood (primarily the former), and many others had planted for fruit, shade or other purposes. Survival rates were high. Seedlings were widely available, usually to be collected from under existing trees. And at any conceivable rate of expanded planting, lack of land would almost nowhere be a barrier. In sum, the assumed constraints that the Project had set out to remove were found not to exist.

C. Conclusions About Tree-Planting

Given the survey results cited above, the ESU argued that the Project should both lower its expectations and change its direction. Instead of concentrating on seedling nurseries, the Project should move vigorously to establish a national extension programme. This would not be the sort of extension that the Project had envisaged, centered on nurserymen trying to generate seedling sales. Rather, it would work through the existing extension system to expand tree-planting whatever the source of seed or seedlings.

The ESU data suggested a further alteration. Even at expanded levels of planting, people are unlikely to plant enough trees to meet their needs. Deforestation is therefore almost certain to continue. In which case an important Government objective would be to minimize the damage done to agricultural land as trees are cut down. This would mean that all of the (relatively few) trees planted must fulfill a soil-protection function. Both extension and research should therefore be based on the kind of "agroforestry" that establishes trees in ways that can serve soil resources.

To arrive at these conclusions required the ESU to monitor more than simply project outputs. More conventional monitoring and evaluation might well have concentrated on seedling sales, as if success was measured by the extent to which these met project targets. But from the Malawi experience, it appears that project targets may not always be valid. For example, the ESU was able to show that seedling sales were far below targets simply because the targets were overstated. This can easily arise when project preparation is based on inadequate information.

Even accurate targets would be misleading if the seedling sales were not the main issues, but tree-planting was. In Malawi, the shortfall in seedling sales led immediately to proposals for greater "marketing" by Project nurserymen. However, the ESU had found that about 90% of all tree-planting was taking place without reference to the Wood Energy Project, usually through transplanting of naturally-grown seedlings. The ESU's recommendations therefore dealt with all people who were showing interest in planting trees, whatever the source of their seedlings. A primary focus on sales from seedling nurseries would have left most of this activity unconsidered.

This analysis was ready when needed because the ESU from the beginning had monitored Malawi's overall wood energy situation, not just the Wood Energy Project. Initially, project managers were not entirely convinced of the relevance of this work. However, when the project began to encounter difficulties in its approach to rural households, the ESU's findings were available to explain the nature of the problem and to suggest what could be done about it.

## D. Impact of ESU Studies on the Wood Energy Project

Taken as a whole, the ESU's studies implied important changes in the Wood Energy Project. For example, it proposed that seedling nurseries should be assigned a relatively low priority, rathe than dominating the project's approach to rural households. Major attention should be given instead to forestry extension, acting through the existing agricultural extension service. Moreover, the extension message should stress planting of trees less for wood energy than for the protection of agricultural land. Supporting services such as forestry research should be adapted to these new goals. Since the project had made virtually no provision for extension, much less "agroforestry" extension, such alterations in its direction would have to be substantial.

At least initially, these ideas met with little enthusiasm. There were several reasons for this. First, the ESU's findings implied a sense of local realities very different from those that had been taken for granted. For example, the planners had assumed that smallholders were largely ignorant of the wood energy problem, and lacked the tree seedlings and silvicultural knowledge to allow them to confront it. The ESU monitoring and evaluation activities found that smallholders lacked neither knowledge nor seedlings, and that their problems would have to be understood in different ways.

Second, much of the project was in place before the ESU's findings became available: houses and stores had been built for nurserymen, plantation land had been cleared and infrastructure established. Even if the results had been immediately convincing, it would have been difficult to tear down buildings, relocate offices and roads, and so on.

Third, the project as established spread its benefits, including employment, across all three of Malawi's regions. This served an obvious political purpose, even if some nurseries and plantations met little need for seedlings and wood. To concentrate the project more in areas of need could have led to protests by local officials whose areas were apparently being "abandoned".

For these reasons, the ESU's impact was relatively limited during the project's first phase (1980-1985). To a greater or lesser degree, project officials gained a deeper understanding of Malawi's wood energy situation, but they saw few ways to act on this knowledge. In key respects, the project's initial momentum was to carry it unaltered through its first five years.

In spite of this, some new initiatives were taken. For example, a forestry extension course was added for the first time to the curriculum of the Natural Resources College (NRC), at which all of Malawi's extension workers are trained. The ESU then took the lead in creating a syllabus for this course and in preparing a forester to teach it. In collaboration with the NRC, the ESU also established its own programme of demonstration woodlots and agroforestry areas. The extension spirit thus generated was spread through visits by ESU staff to the Agricultural Development Divisions in which extension activities are centered.

More important, however, should be the ESU's impact on the Project's second phase (1985-1990). By 1984, the initial planning of the second phase was clearly showing the ESU's influence, with attention being given centrally to extension, agroforestry, the needs of urban areas (especially Blantyre), and so on. If these priorities continue to be dominant as Phase II takes final form, the ESU will have achieved what it set out to do.

## 4. OBSERVATIONS FROM THE ESU'S EXPERIENCE

The ESU's experience can be summarized in terms of the common issues that arise in implementing any system for project monitoring and evaluation.

### A. Objectives of The Monitoring and Evaluation System

Monitoring and evaluation are usually construed as ways to measure the progress and impact of a given development project. In addition to these the ESU focused on the relevance of the project and the validity of the objectives. It sought first, to understand the national wood energy situation; second, to determine the proper response to that situation; third, to judge whether the Wood Energy Project's activities were in line with this response. The results of operating the monitoring and evaluation system in this way have been discussed in detail in the sections above.

### B. Location of the Monitoring and Evaluation Unit

As already shown the ESU carried out its work in partial isolation from the rest of the Project. Even when the ESU was transferred into the Forestry Department's Wood Energy Division, it maintained separate offices some distance from Project headquarters.

The situation had its disadvantages, as Project managers felt somewhat isolated from the ESU and its work. The ESU tried to advance new ideas through informal daily contacts with other Project staff, but its isolation sometimes made this difficult. For some staff, the ESU became visible mostly when issuing its reports. Since these often advanced views in contradiction to the governing assumptions of the Projects, relationships between ESU and the rest of the Project were sometimes uneasy.

On the other hand, the ESU's independence allowed it to look objectively at the Project in its larger context. Isolation therefore had a productive aspect. The ESU would have found its work much more difficult if it had been controlled more directly by those whose assumptions had determined the Project's initial structure.

It may well be that isolation was advantageous to the ESU while it explored Malawi's wood energy realities and measured the Project against these. Assuming that the Project's second phase is more in line with local conditions, however, the ESU should find itself spending more time on conventional monitoring and evaluation of project variables. At that point, it would be logical to seek a more intimate relationship with project management.

## C. Type and Frequency of Studies

Studies are a function of objectives. As outlined in Table A, the ESU's studies were primarily designed to describe the situation of various categories of wood users. Major studies were therefore done on rural households, on urban households, and on tobacco estates. A number of supporting studies were done in connection with this work.

Most studies were done only once, although a survey of the Project's seedling sales was carried out by the ESU annually. Toward the end of the Project, arrangements were being made to add a wood energy questionnaire to Malawi's Annual Survey of Agriculture. This would allow the ESU to monitor yearly changes in wood scarcity, tree-planting activities, and other variables measured in its earlier rural surveys. Other surveys (urban energy, tobacco estates) could easily be repeated in later years if it seemed desirable to update them.

The ESU's experience suggest that basic surveys can be carried out relatively rapidly and inexpensively. For example, the ESU estimates that any one of its principal surveys (rural energy, urban energy, smallholder tree-planting) could have been completed in 6-8 months at a cost of no more than $75,000, including expatriate assistance throughout. Using exclusively local resources, the cost would have been less.

## D. Staffing

Staffing depends on the type and frequency of studies to be carried out. Since the ESU's work could only generally be defined when the Project began, initial staffing was limited to four senior officers. These were to be supplemented as required by consultants and temporary supporting staff (survey enumerators, labourers, etc.). The ESU was thus able to let priorities evolve naturally as a result of its work programme, rather than being imposed by staffing decisions at the outset of the Project.

To provide for professional balance, the ESU set up parallel sections to deal with social and engineering issues. To stress their parity, the two sections were headed by officers of equal grade. Overall supervision was provided by officers with a broad background in economics, social analysis, and project planning. This organization was designed to ensure that the ESU would give attention to economic, social and engineering issues together. Since the Forestry Department lacked officers with professional training in these areas, the ESU's initial staff was all recruited from outside the Department.

One important result was that none of the ESU's staff had been involved in preparing the Project. This enabled the ESU to carry out its monitoring and evaluation activities without preconceptions as to what it would find.

## E. Data Collection

The ESU designed and tested all its own surveys. Every survey went through 8-10 drafts and was pre tested three separate times, being rewritten after each. From the ESU's experience, this seems the minimum amount of preparation required to ensure a reliable survey.

Survey data were collected in various ways. For two of its major studies (smallholder tree-planting, urban energy), the ESU relied on its own team of 5-6 enumerators. This had the advantage of allowing enumerators to be carefully selected, trained and supervised by the Energy Surveys Officer. Relatively complex questions could therefore be

asked, and problems were readily resolved through daily contact between the Surveys Officer and his enumerators in the field. The enumerators were also available to help with data processing between field trips.

A disadvantage of this approach was that only about 50 interviews could be conducted in total per day, meaning that 8-10 weeks were required in the field for a national survey. Allowing time in the offices between trips to record data and deal with administrative issues, the time required to collect all data for each survey was therefore 3-5 months. A further disadvantage was the lack of sufficient work to sustain an enumeration team permanently. The ESU therefore hired its enumerators on a temporary basis for about eighteen months. Morale, and therefore performance, suffered in the last weeks as the enumerators knew they were on the verge of being laid off.

For its rural energy studies, the ESU prepared questionnaires for administration by networks of enumerators already in place for national surveys of agriculture. This had the advantage that large numbers of people could be reached quickly. On the other hand, questions had to be simplified since the enumerators could not be directly trained by the ESU. In addition, to avoid lengthy delays, the ESU had to insist that schedules be returned directly to it for checking and processing.

Other data were provided by field staff of the Forestry Department, who reported on nursery performance, plantation work, National Tree Planting Day activities, and other matters. Field staff typically had a much more accurate sense of local realities than did headquarters personnel. However, since these officers had many duties other than data-collection, their reports were often late and incomplete. In addition, field staff in effect were being asked to report on the success of their own work. Inevitably, they came to view their reports more as a way to demonstrate progress than as a means of proving reality. As a result, regardless of what field staff were actually experiencing, their reports tended to reinforce the view at headquarters that all was basically well with the Project's conception and implementation. Presumably, it is better for data to be gathered by people without a vested interest in the results.

## F. Data Processing

The ESU's first survey (rural energy) was processed on a mainframe computer at the national Data Processing Unit (DPU). This allowed many tables to be generated quickly from large amounts of data. The method was appropriate to this particular survey, which was straightforward enough that the tables required were easily predictable.

The ESU concluded, however, that the mainframe approach could be cumbersome in more complex surveys. This would be notably true in cases where early analysis raised new thoughts about relationships among variables. Since the DPU computer required a special programme for each survey, to study unforeseen relationships would require rewriting the programme. Even if a more flexible statistical package had been available, repeated trips to this very busy computer might have been difficult to arrange. In later surveys, the ESU tried other methods of data processing.

For its tree-planting and urban energy surveys, the ESU used Paramount cards, each of which had 198 numbered holes punched around its edges. Each household's responses were recorded directly on a single card. Every possible answer was assigned a number corresponding to one of the pre-punched holes in the card. At the office, the enumerators used special clippers to convert holes into slots in line with the answers given. Counting of responses was then done by assemblig a pile of cards, inserting a needle through the holes corresponding to a given answer, and counting the slotted cards dropping away from the needle.

In comparison with the mainframe approach, the Paramount cards offered great flexibility. New frequency or contingency tables could be readily assembled by ESU staff. However, this method proved to have two conspicuous disadvantages. First, unless very carefully supervised, enumerators made many mistakes in counting piles of cards and recording their numbers. Second, to produce any large number of tables could take days of work. Toward the end of the Project, the ESU therefore began to experiment with microcomputers hoping these might combine the best features of mainframe computers and Paramount cards.

## G. Interpretation of Findings

Once basic tables were prepared from survey data, the ESU found it invaluable to discuss these with enumerators and supervisors, agricultural or forestry field staff, urban planners, or others with an independent view of the problems being studied. Often, these discussions allowed sense to be made of otherwise puzzling findings.

For example, the rural energy survey showed women in one area reporting exceptional difficulty in gathering firewood, even though this was to be found only half a mile away. When people familiar with the area were questioned, it turned out that the half-mile was straight up the side of a mountain.

In another instance, local officials simply refused to believe the ESU's findings on a particular point. When the ESU checked its data cards, it found that results for two localities had mistakenly been transposed in recording the answers to a set of questions. In all these examples, and in many other cases, survey results could have been seriously misinterpreted had they not been reviewed by people with special knowledge of local conditions.

## H. Presentation of Findings

THe ESU presented its findings mainly through written reports or through comments at meetings where Project issues were being discussed. During the first phase of the Project, neither method was wholly satisfactory. When major reports were issued, for example, their implications were not always apparent in terms of the day-to-day management decisions that most claimed the attention of Project officials. Busy with these other matters, officials often read the ESU's reports and simply set them aside.

Other problems arose when the ESU tried to relate its ideas to the specific issues raised for decision at management meetings. For example, a meeting might be held to consider whether a given forester should be spending time mostly on extension or on working plans for plantations. In such a case, the ESU might make a strong case for extension, based on the findings of its rural surveys. However, if Project officials had not read these surveys with care, the ESU's views would be heard outside their analytical framework and could seem simply capricious.

The only way around these difficulties was to set aside time for the ESU to provide a full exposition of a given study. To be genuinely productive, however, this had to be done in the context of concrete issues then confronting Project management. During the first phase of the Project, this happened most notably at lengthy meetings on policy toward charcoal production and forestry extension. In both cases, ESU reports served as the working papers for the discussions.

The technique worked in these two instances because initial Project planning on charcoal and extension had been extremely nebulous. Under these circumstances, a complete discussion of salient issues was possible before deciding what action the Project should take. Where the Project had specific targets to meet, as with nurseries and plantations, there was less interest in entertaining proposals for change. In these latter cases, it may have been that no means of presenting the ESU's data could have had dramatic impact during the Project's first phase.

On the other hand, Phase II was initially open for definition in response to careful thought about Malawi's wood energy situation. As work began on Phase II, the ESU was therefore able to present the reports it had produced on Malawi's major wood users and on special issues like charcoal and the economics of reforestation. These reports were to become basic sources of information for Phase II planning.

## 5. CONCLUSIONS

The ESU's studies induced changes in the implementation of the Wood Energy Project. To a great extent these changes were based on studies of the project context rather than on analysis of the internal consistency of the project. This allowed the ESU to assess the relevance of the project in terms of the Malawi's wood energy situation as a whole. As the ESU was to discover by monitoring the Project's context, adjustment to the actual situation required major changes in direction. For example, the Project concentrated on seedling nurseries and largely ignored extension. By contrast, the situation in rural areas implied a dominant emphasis on extension, with only limited need for nurseries. Lacking information on the demand for wood, the Project had spread plantations the length of the country. However, data on urban wood users suggested that plantations might best be concentrated near Blantyre, where both demand and problems of supply were greatest.

The lack of correspondence between the Project and its context came about because there was neither time nor resources to gather basic data during the Project's preparation. There is nothing unusual about this: planners almost never carry out detailed surveys of local conditions while preparing projects.

It seems plausible that many forestry projects may share the Wood Energy Project's difficulties. However, this can only be known if monitoring and evaluation focuses on the projects and the broader contexts within which they fit. This implies monitoring and evaluation of the broader project situation, attitudes and activities of the main participants. The objective should be to learn more about local conditions to be sure that the project is responsive to these conditions. Based on the experience of the Malawi Wood Energy project it could also be argued that the study of the project situation should take place at the project planning stage. Only when the project fits its context, can the monitoring and evaluation system narrow its attention to the inputs, outputs and impacts of the project itself.

## ANNEX I

## RURAL ENERGY SURVEY

FUEL CODES ( FOR QUESTIONS 1 AND 2)

0 - Not Applicable
1 - Firewood
2 - Charcoal
3 - Crop Residues
4 - Animal Dung
5 - Paraffin
6 - Propane
7 - Candles
8 - Electricity
9 - Other

1. Which of the following things are done by members of your household at this time of year, and what fuel is used most often to do each thing? (Enter fuel code for each thing done. If something is not done at all at this time of year, enter "0")

a. Heating water for washing/bathing — Fuel Code:
b. Heating water for tea of coffee — Fuel Code:
c. Providing light — Fuel Code:
d. Keeping warm — Fuel Code:
e. Making beer — Fuel Code:
f. Curing tobacco — Fuel Code:
g. Smoking fish or meat — Fuel Code:
h. Making bricks — Fuel Code:
i. Making charcoal for sale to others — Fuel Code:

2. At this time of year, what fuel (or fuels) are used in your household for cooking?

a. Fuel used most often — Fuel Code:
b. Fuel used next most often — Fuel Code:

If you use firewood at this time of year, do you (and other members of your household):

Collect All Yourselves
Collect Some/Buy Some
Buy All
Other
Not Applicable

| | | |
|---|---|---|
| 4. | In your household, is collecting firewood an easy or a difficult thing to do at this time of year? | Easy<br>Difficult<br>Not Applicable |
| 5. | Five years ago, was collecting firewood easier , about the same as now, or more difficult? | Easier<br>About the Same<br>More Difficult<br>Not Applicable |
| 6. | Where do you usually collect your firewood at this time of year, and how far is this place from your home? | Less Than ½ Mile<br>½ Mile Up To 1 Mile<br>1 Mile Up To 2 Miles<br>2 Miles Up To 3 Miles<br>4 Miles Up To 4 Miles<br>More Than 4 Miles<br>Not Applicable |
| 7. | During the past month, have you used any wood from mango trees for firewood? | Yes<br>No |
| 8. | What is your fireplace or cooking stove made of? (tick all kinds used.) | Stones or Bricks<br>Mud or Clay<br>Metal<br>Other |
| 9. | How many times yesterday did you cook food? | Didn't Cook Yesterday<br>Once<br>Twice<br>Three or More Times |
| 10. | In the last year, has anybody in your household planted any trees, either on National Tree Planting Day or at some other time? | Yes, On Tree Planting Day<br>Yes, Other Than On Tree Planting Day<br>No, Trees Planted |
| 11. | If trees were planted, what will they be used for? (Tick all uses mentioned.) | Firewood<br>Fruit<br>Building Poles<br>Animal Feed<br>Other<br>No Trees Planted |

## ANNEX II

### SMALLHOLDER TREE-PLANTING SURVEY

(English translation; original in Chichewa)

| | | |
|---|---|---|
| 1. | Five years ago, were there more trees than now or less?<br><br>(IF "MORE", CONTINUE. IF OTHER, GO TO Q. 4) | More 5 Years Ago<br>Same as Now<br>Less 5 Years Ago |
| 2. | Has the cutting of trees reduced soil fertility in your garden? | Yes<br>No<br>Don't Know |
| 3. | How? | (OPEN ENDED) |
| 4. | Is it easy or difficult to get building poles for your household needs?<br><br>(IF "DIFFICULT", CONTINUE. IF "EASY", GO TO Q.6) | Easy<br>Difficult<br>Not Applicable |
| 5. | Why? | Wood is Far/Scarce<br>Physical Hardship<br>Wood Is In Restricted Area<br>Other (specify) |
| 6. | Do you buy or collect your building poles? | Collect<br>Collect and Buy<br>Buy All<br>Other (specify)<br>Not Applicable |
| 7. | Did anyone in your household buy firewood last year?<br><br>(IF "YES", CONTINUE. IF "NO" GO TO Q.9) | Yes<br>No<br>Don't Know |
| 8. | For what purpose? | Curing Tobacco<br>Cooking<br>Brewing Beer<br>Making Bricks<br>Other (specify) |

| | | |
|---|---|---|
| 9. | Do trees left in the garden help crop production?<br><br>(IF "YES", CONTINUE. IF OTHER, GO TO Q.12) | Yes<br>No<br>Don't Know |
| 10. | How? | (OPEN ENDED) |
| 11. | What kind of trees? | Acacia albida<br>Other (specify) |
| 12. | During the past 5 years, have you planted any trees for building poles or firewood?<br><br>(IF "NO", CONTINUE. IF "YES, GO TO Q.18) | Yes<br>No |
| 13. | Would you get any benefits from planting trees?<br>(IF "YES", CONTINUE, IF "NO", GO TO Q.15 ) | Yes<br>No<br>Don't Know |
| 14. | What benefits? | Income from Sales<br>Supply of Poles<br>Supply of Firewood<br>Other (specify) |
| 15. | If you were going to plant trees, what species would you plant?<br><br>(IF TREES ARE LISTED, CONTINUE. IF DON'T KNOW, GO TO Q.17) | Blue-gum<br>Gmelina<br>Cassia<br>Fruit<br>Other (specify)<br>Don't Know |
| 16. | Why these species? | (OPEN ENDED) |
| 17. | Why have you never planted trees? (GO TO Q.30) | (OPEN ENDED) |
| 18. | What species did you plant?<br><br>(IF "BLUE GUM", CONTINUE. IF OTHER, GO TO Q.20) | Blue-gum<br>Gmelina<br>Cassia<br>Other (specify) |
| 19. | Did you apply fertilizer to your seedlings? | Yes<br>No<br>Don't Know |

| | | |
|---|---|---|
| 20. | How many trees did you plant? | 1 - 10<br>11 - 20<br>21 - 40<br>41 - 60<br>61 - 80<br>81 - 100<br>101 - 140<br>141 - 180<br>181 or More<br>Don't Know |
| 21. | When did you plant the trees? | '81 - '82 Rainy Season<br>'80 - '81 Rainy Season<br>'79 - '80 Rainy Season<br>'78 - '79 Rainy Season<br>'77 - '78 Rainy Season<br>'76 - '77 Rainy Season |
| 22. | Where did you get the seedlings?<br><br>(IF SEEDLINS WERE BOUGHT, CONTINUE, IF FREE, GO TO Q.24) | Wood Energy Project Nursery<br>Other Govt. Nursery<br>Raised Own Seedlings<br>Bought From Other Person<br>Seedlings Under Trees<br>Other (specify)<br>Don't Know |
| 23. | How much did each seedling cost? | 1 Tambala<br>2½ Tambala<br>Other (specify)<br>Don't Know |
| 24. | Did all the trees you planted survive?<br><br>(IF "NO", CONTINUE. IF "YES", GO TO Q.27) | Yes<br>No |
| 25. | How many of your trees died? | (OPEN ENDED) |
| 26. | Why did they die? | (OPEN ENDED) |
| 27. | What will you use the trees for? | Sell as Poles<br>Sell as Firewood<br>Use as Poles<br>Use as Firewood<br>Other |
| 28. | If you were going to plant more trees next year, what species would you plant?<br><br>(IF TREES ARE LISTED, CONTINUE. IF DON'T KNOW, GO TO Q.30) | Blu-gum<br>Gmelina<br>Cassia<br>Other (specify)<br>Fruit<br>Don't Know |

| | | |
|---|---|---|
| 29. | Why these species? | (OPEN ENDED) |
| 30. | Where is the nearest source of seedlings?<br>(IF "WEP NURSERY", CONTINUE, IF OTHER, GO TO Q.36) | WEP Nursery<br>Other (specify)<br>Don't Know |
| 31. | Is this place well located?<br>(IF "NO", CONTINUE. IF "YES", GO TO Q.34) | Yes<br>No |
| 32. | Why not? | (OPEN ENDED) |
| 33. | Can you suggest a better place? | Market/Trading Centre<br>Admare Depot<br>School<br>Church<br>Other (specify) |
| 34. | Do you know the species sold at the nursery? | Blue-gum<br>Gmelina<br>Cassia<br>Fruit<br>Other (specify)<br>Don't Know |
| 35. | How much are the seedling there? | 1 Tambala<br>2½ Tambala<br>Other<br>Don't know |
| 36. | There are two ways of establishing a woodlot. It can be done individually or by the village. What problems may arise with the village woodlot? | (OPEN ENDED) |
| 37. | Have you ever participated in a village woodlot? | Yes<br>No |
| 38. | Could you find land where you could establish an individual woodlot? | Yes<br>No<br>Don't know |
| 39. | In the past year, did you ever talk to a government officer about tree planting?<br>(IF "YES", CONTINUE. IF "NO", GO TO Q.41) | Yes<br>No |

40. What sort of officer was he?

Nurseryman
Extension Worker
Other (specify)
Don't Know

41. Do you grow tobacco?

Yes
No

(IF "YES", CONTINUE. IF "NO", END OF SURVEY)

42. What type?

Fired Cured
Sun/Air Cured
Oriental
Flue-Cured
Burley

(IF "FIRE CURED", CONTINUE.
IF OTHER, END OF SURVEY)

43. Is it easy or difficult to get wood for curing tobacco?

Easy
Difficult

44. Do you buy or collect yourwood for curing?

Collect
Collect and Buy
Buy All
Other (specify)

(END OF SURVEY)

# ANNEX III

## OTHER WOOD ENERGY STUDIES

As explained in the main text of this report the ESU studied other issues related to the implementation of the Malawi Wood Energy Project, but much had no direct relationship with participatory activities involving rural people. Because of their general interest, these are briefly described below.

### 1. Wood Saving Through Improved Stoves

The ESU looked at another issue bearing on energy use in rural household: the potential for wood saving through the introduction of improved stoves. In early planning documents, it had been assumed that the ESU would have a technical officer to design and disseminate fuel-efficient mudstoves. Fortunately, this provision was dropped before the Project took final form. It was also fortunate that the Project stipulated no targets for the introduction of mudstoves in rural areas. The ESU therefore had the opportunity to determine whether mudstoves made sense before the decision was made as to whether they should be spread across the country.

After extensive testing, the ESU produced a stove that used about one-half as much wood as the traditional three stones to cook a standard meal. When the stoves were tried on a pilot basis in rural homes, however, results proved less encouraging. Compared with outdoor cooking fires, the indoor mudstoves again saved about half the wood required to prepare a standard meal. However, the ESU found that most women cook indoors, where the efficiency of the traditional three-stone fire is greatly improved. When both the ESU mudstove and three stones were used inside the same kitchen, the mudstove saved only about 5% of the wood used to cook on three stones.

To estimate efficiencies, a series of standard meals were cooked on both the ESU mudstove and the usual three stones. The average amounts of wood consumed per meal by each type of stove were then compared. The women doing the cooking were also asked about wood savings, but their answers bore little relation to the amounts of fuel consumed. Significant savings were reported for the mudstove even where measurements showed little change or (in a few cases) an actual increase in wood consumption compared with three stones. Apparently, the extension officers helping with the stoves had let slip the purpose of the tests, and the women were being polite.

To give the mudstoves the benefit of the doubt, the ESU estimated that average savings of as much as 20% might be realized using mudstoves to cook standard meals in rural homes. Using other information from its rural surveys, however, the ESU found that siginificant adjustements would have to be made in this figure to show the potential impact of mudstoves on national tree consumption.

| | |
|---|---|
| Potential savings in wood consumption, ESU mudstove vs. three stoves, under village conditions. (Estimate based on ESU field tests). | 20% savings |
| Adjustment 1: Times the proportion of wood use in rural household that could be diverted to the improved stove. (Excludes activities | X 3/5 = 12% savings |

that would not be done on mudstoves: space heating, lighting, fish and meat drying, beer brewing, some water heating, cooking of foods such as pumpkins in larg pots. Estimate based on findings of rural energy survey concerning ways in which wood is used, along with rough field observations of amount of wood used for each purpose).

Adjustment 2: Times proportion of year in which stove will be used. (Exludes periods when weather is too cold or too hot to cook indoors on mudstove, as well as periods when wet wood or other fuels unsuitable for mudstove are commonly used. Estimate based on interviews with village women concerning problems encountered when using mudstoves). X 3/4 = 9% savings

Adjustment 3: Times proportion of above savings that could realistically be sustained on average over the long term, given losses in efficiency as the stove cracks, deteriorates, and has to be rebuilt. (Estimate based on observation of stove durability at ESU testing area and in village homes) X 2/3 = 6% savings

Adjustment 4: Times proportion of rural population that might be expected to build improved stoves given a massive extension campaing over several years: in Malawi, c. 500,000 stoves. (Assumes unprecedented rate of adoption of new technology under rural Malawi conditions). X 2/5 = 2.4% savings

Adjustment 5: Times proportion of national firewood consumption attributable in Malawi to rural households. (Estimate based on ESU and Forestry Department data on national firewood consumption). X 3/5 = 1.4% savings

Adjustment 6: Times proportion of annual tree cutting attributable to firewood consumption. (Excludes trees cut for poles, clearing of new land for food production, and other non-firewood purposes. Based on Forestry Department figures on firewood and pole consumption, plus a rough guess as to the amount of new agricultural land required annually in line with growth of population). X 1/2

Thus: Maximum national reduction in cutting of trees given large stove dissemination programme in rural areas of Malawi. - 0.7%

According to the ESU, savings from the introduction of mudstoves in urban areas might be another 0.1% of national consumption of trees, giving a maximum potential saving of 0.8% for a large woodstove programme. However, since all the assumptions on which these figures are based are optimistic (some very much so), actual savings from such a programme would be unlikely to exceed one-half of one percent of all trees cut each year.

Even savings as modest as these could be achieved only with enormous effort. In Malawi, dissemination would have to be carried out by the agricultural extension service, virtually all of which would have to be assigned to nothing but stove-building for very long periods. Government might find it cheaper to do this than to plant equivalent numbers of trees. However, both these alternatives are prohibitively expensive as ways to deal with household fuel problems especially in rural areas. According to the ESU's findings, the Project could best devote its resources in rural areas to extension in support of ecologically-based tree-planting. At least in terms of woods savings, no mudstove dissemination programme could be justified.

Two factors strengthened the ESU's hand in carrying out this work. First, although planners had originally intended that mudstoves be widely disseminated, the Project only required that the matter be studied. When the ESU decided that a mudstove programme would be undesirable, this posed no threat to the realization of Project targets. Had mudstoves themselves been specified as a Project "output", to arrive at such a conclusion would have been much more difficult.

Second, the ESU's multidisciplinary staffing enabled it to view mudstoves in their social context as well as in technical terms. If stoves had been considered a design and dissemination problem alone, work would still be continuing to refine and promote the ESU stove. However, the ESU had also studied the way wood fuels are actually used both in rural households and in the country as a whole. This kind of context monitoring and evaluation raised doubts about mudstove dissemination that could not have emerged if attention had been given only to the technical aspects of stove design.

## 2. Urban Users of Wood Fuels

The Project's intentions with respect ot urban wood users were far from clear. Initially, the project preparation report had noted only a general need to "help meet the demand for fuelwood and poles by the rural and urban population". Presumably in response to urban requirements, 11 700 ha of plantations were to be planted near Malawi's three largest cities (Blantyre, Zomba, Lilongwe). Smaller plantations were to be established near Kasungu and Karonga.

The World Bank's appraisal report retained these plantations, but viewed them as a way to produce fulwood and poles "mainly for sale to commercial users who include industrial users (tea estates, bakeries and commercial brick-burners), tobacco estates and commercial tobacco farmers". Most of these are rural establishments, however. At this point, no explicit provision was being made for the needs of any urban wood users other than bakeries.

Even when it came to rural users, the appraisal report made no assessment of commercial demand. The relationship between plantations and the intended users of their wood was therefore extremely tenuous. It was to become more so. By the time the Project began, key officials were describing the plantations as "strategic reserves". This

meant that although there might be little current need for wood from a given plantation, its trees could be held in reserve to meet any demand that might arise in future. According to this criterion, plantations could be established almost anywhere.

In practice, planting was simply done on existing forestry reserves, where the work could be most easily managed. Some of these were relatively close to cities or to concentrations of tea and tobacco estates. In other instances, however, plantations were established far from any likely demand for wood. In one conspicuous case, 1 500 hectares of plantation intended for Lilongwe were shifted at the last minute to a forestry reserve 100 kilometers away, well beyond the economic distance for supplying any sort of wood fuel to the city.

The consequences of this approach became evident as the Project got underway. In Blantyre and Zomba, most of the indigenous wood cleared to establish plantations was sold, usually to tea and tobacco estates. This gave promise that a market would exist for the plantation wood when it matured. In other areas, however, much of the wood being cleared had to be burned or was simply left to rot. In these cases, there was reason for concern about ultimate demand for the Project's trees.

These developments largely stemmed from the inadequacy of information available when the Project was prepared. As had also been the case in rural areas, planners found themselves without time or resources to survey the actual needs of urban and commercial wood users. Under the best of circumstances, this meant that plantations could have been sited only very vaguely in relation to centers of likely demand.

To explore the situation in detail, the ESU began by distinguishing urban users from tea and tobacco estates, the major commercial users of wood for fuel. In the latter cases, the ESU noted that existing laws already required estates to grow their own wood. Once this situation was well understood, it seemed unlikely that Government would choose to provide estates with wood,thus allowing them to avoid their statutory obligations. This seemed doubly true since the wood would have to be offered to estates at competitive prices rather than at actual cost. Since estates were largely relying on "free" wood from their own property or nearby customary land, this would imply Government subsidies of roughly $20 for every cubic meter sold. The ESU later surveyed estates to determine ways in which Government could encourage them to plant more trees or use wood more efficiently. However, it was apparent that no long-term policy could be based on selling wood from Project plantations to estates.

The ESU then turned its attention to the cities. It was assumed that households would use most wood, with other users (bakeries, schools, hospitals, military barracks, etc.) accounting for a very small portion of urban consumption. This assumption proved correct. The findings reported below therefore concentrate on urban issues in terms of household needs for wood energy.

## 2.1 Urban Energy Survey

Between December 1982 and May 1983, the ESU carried out a survey of energy use in Malawi's four major cities: Blantyre, Lilongwe, Zomba and Mzuzu. Together, these cities accounted for 79% of all people classified as "urban" in the last national census, carried out in 1977. Under the supervision of the ESU's Energy Surveys Officer, five enumerators interviewed the central women in each of 1,941 households. Results were recorded on cards and processed by ESU staff.

Predictably, the ESU found that wood and charcoal were the dominant fuels for practically all uses in most urban households. For example, 90% of the urban population cook with firewood or charcoal, and more than 80% regularly use these fuels to heat water or keep warm. The only exception to the rule is lighting, for which paraffin and electricity are used.

The dependece of wood for energy is greatly magnified by the extensive use of charcoal in city as opposed to countryside (where charcoal is almost never used). On a per capita basis, people in urban areas consume 114 kg of charcoal and 306 kg of firewood annually. Since the ESU estimates that charcoal in Malawi is made with an average production efficiency of 14% 114 kg of charcoal start out as 814 kg of wood. Adding the 306 kg of firewood used per person, this means that the average city dweller annually consumes 1,120 kg of wood, equivalent to 1.4 solid cubic meters. This is nearly two-thirds more wood than the estimated rural consumption of 0.85 cubic meters per capita.

Urban wood consumption is therefore disproportionate to urban population. In 1983, when only 7% of Malawi's population lived in cities, 12% of all trees cut for fuel went to urban areas in the form of firewood or charcoal. According to the ESU's findings, the situration is likely to grow worse. For one thing, city population is growing considerably faster than total population. In addition, rising urban income is likely to increase consumption of trees for fuel, since people shift from firewood to tree-intensive charcoal as their incomes go up. Any such tendency would be accentuated by the current drift from electricity and paraffin to use of firewood and charcoal due to changes in the relative price of urban fuels. Taking all these factors together, it is likely that 15% or more of trees cut for fuel will be used in cities by 1990.

Most of the fuel from these trees will be going to Blantyre, which accounts for 48% of Malawi's urban population and which uses unusual amounts of charcoal. According to the ESU, Blantyre by 1990 would account for 57% of urban consumption, and 8% of national consumption, of trees for fuel. The situation is compounded by the fact that Blantyre has fewer nearby forest reserves than any other major city.

The ESU drew two conclusions from this information. First, urban wood demand constitues a major problem of concern to Government. Although forestry extension is vital in rural areas, smallholders and estate owners must ultimately provide their own wood. In cities, on the other hand, people cannot grow their own wood. Nor, as noted earlier, can smallholders be expected to grow firewood for sale to urban users. Government itself must therefore take direct action to meet urban needs. The only alternative would be to let environmental damage spread unchecked around major cities as the last indigenous trees are cut for sale.

Second, the problem is too vast for Government to tackle as a whole. All urban areas together will require 1.6 million cubic meters of wood for fuel in 1990. For Government to supply this through plantations would require an immediate investment of $60 million, clearly an impossible target. Since Government can only deal with the problem in part, it should start with Blantyre where demand is greatest and available supplies least.

Only 26% of the area to be planted by the Project was planned to serve Blantyre; much of the rest was to be established in areas of limited present demand for wood. The ESU's analysis implied substantial revisions in the Project's plantation strategy. By contrast, the ESU suggested that <u>all</u> wood energy plantations, at this stage, might best to devote to meeting Blantyre's needs.

In terms of planned "outputs", the Project was successfully establishing its plantations. but the ESU focused more on the needs of wood users than on the Project's planting targets. So when problems arose of selling wood cleared from plantation sites, the ESU was prepared to document how plantations might be better placed in relation to demand for their wood.

## 2.2 Charcoal Studies

The project's appraisal report had noted that large amounts of wood were becoming available far from markets, especially through clearing of land for agriculture and the conversion of indigenous forest reserves to plantations. Since charcoal is more economic to transport than firewood, the prospects for charcoal-making should be investigated.

Funds were therefore provided for charcoal trials, with emphasis on the technical aspects of charcoal-making. One early suggestion was that available funds be used to establish a substantial capacity for making charcoal at a plantation near Lilongwe. However, the ESU suggested that studies should first be made of the feasibility of producing charcoal in this way.

Results of the ESU studies challenged some of the Project's assumptions about charcoal. For example, the appraisal report had asserted that the "traditional method of charcoal burning is wasteful and inefficent". The reality proved more complex. In tests by the ESU's Energy Systems Officer and a traditional charcoal-marker hired for the trials, an earth mound kiln produced charcoal at efficiencies of 21.5% by weight, as opposed to 24.2% in metal kilns. The metal-kiln charcoal was of higher quality, so that energy efficiencies (joules in the charcoal output divided by joules in the firewood input) were metal kiln charcoal 43.2%; earth mound charcoal 33.3%. In other words, metal kilns wasted 57% of the original wood energy and earth mound kilns 67%. This difference could hardly warrant a massive conversion to modern charcoal technologies.

We can assume that village-level charcoal production is managed less carefully than were the ESU trials, and that average efficiencies in the field are therefore lower. However, metal kilns would also be less efficient if poorly managed in village use. To introduce new kilns may therfore achive little. Apparently, the most dramatic improvements in charcoal efficiency would come with better management rather than new technologies.

Equally significant were the ESU's economic findings. Since it was decided that charcoal-making should be centered in wood energy plantations such as the one near Lilongwe, the ESU considered production at local sites using either metal, brick or earth mound kilns. At current charcoal prices, rates of return were everwhere negative, no matter what kind of kiln was used.

The major problems was that wood grown on Government plantations costs about $20 per solid cubic meter. Even if kilns were free, charcoal made from wood this expensive could not compete with charcoal from "free" wood on customary land. Government could make production attractive by giving its wood away, but this would imply an annual subsidy of at least $2 million to meet demand for charcoal in Lilongwe alone. Since the primary result would simply be to have charcoal made from Government trees rather than trees from customary land, there was reason to question whether such a programme would be worth its very substantial cost. This seemed especially true since this approach would probably require Government to take over the charcoal business, throwing large numbers of traditional charcoal-makers out of work.

Even if this were the correct approach, Lilongwe would probably be the wrong place to carry it out. Of all cities surveyed in the urban energy survey, Lilongwe had proved to use the least charcoal in proportion to its total demand for wood fuels. If subsidies were to be considered for charcoal production, the ESU suggested, these should instead be devoted to meeting the needs of Blantyre, which by itself accounts for almost two-thirs of all charcoal used in Malawi's cities.

These findings shifted the Project's attention to the actual sources of demand for charcoal, and to the costs of Government action to meet this demand. As a result, it was decided not to move immediately into charcoal production by Government at its plantation near Lilongwe.

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